



TB CARE II

USAID TB CARE II Project

Core Annual Report

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
OVERVIEW	5
Progress and Significant Achievements	5
UNIVERSAL ACCESS	7
<i>1.7 Improving IPT Delivery to Children and HIV contacts</i>	<i>7</i>
INFECTION CONTROL	9
<i>3.12 Standardized UVGI Fixture</i>	<i>9</i>
<i>3.13 Building Capacity for Infection Control</i>	<i>11</i>
<i>3.14 Casebook for Infection Control Designs</i>	<i>12</i>
<i>3.9 Tajikistan Demo Site</i>	<i>14</i>
PMDT	16
<i>4.19 Translation of Management of MDR-TB in Children: A Field Guide</i>	<i>16</i>
<i>4.21 Mobile Application: “The MDR-TB Pocket Guide”</i>	<i>17</i>
<i>4.22 Drug-resistant TB Training Network - Learning Site</i>	<i>18</i>
TB/HIV	20
<i>5.1 Identify best practices for early initiation of ART for TB patients</i>	<i>20</i>
HEALTH SYSTEMS STRENGTHENING	20
<i>7.2.2 Create tools to enable annual strategic planning review/evaluation and build capacity of NTP to carry out these activities</i>	<i>20</i>
<i>6.2 Ethical TB Patient Management Training</i>	<i>21</i>
<i>1.6 Updated Interactive Online and Text Based Refresher Course on TB for Physicians ...</i>	<i>22</i>
<i>6.3 Insurance Tool Kit</i>	<i>24</i>
<i>Vietnam FAST Activity</i>	<i>24</i>
<i>FAST in Malawi</i>	<i>35</i>
<i>TB In Mines</i>	<i>38</i>
<i>South Africa</i>	<i>39</i>
<i>Zimbabwe</i>	<i>40</i>
<i>Swaziland</i>	<i>41</i>
<i>Botswana</i>	<i>43</i>
ADMINISTRATION OF CORE ACTIVITIES	45

LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
CLA	Canadian Lung Association
CLSI	Clinical and Laboratory Standards Institute
DOTS	Directly Observed Treatment Short-course
EHG	Euro Health Group
HIV	Human Immunodeficiency Virus
IPC	Infection Prevention and Control
IPT	Isoniazid Preventive Therapy
ISTC	International Standards for Tuberculosis Care
MCH	Maternal and Child Health
MDRTB	Multi Drug Resistance Tuberculosis
M&E	Monitoring and Evaluation
MoH	Ministry of Health
NGO	Non Governmental Organization
NJGTBI	New Jersey Global Tuberculosis Institute
NTP	National Tuberculosis Program
PIH	Partners In Health
PMDT	Programmatic Management of Drug-resistant TB
PMTCT	Prevention of Mother to Child Transmission
QA	Quality Assurance
TAC	Technical Assistance Center
TAT	Turn-around Time
TB	Tuberculosis
URC	University Research Co., LLC
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

In project year 5 (FY15), TB CARE II continued work on a diverse range of activities, many of them building on earlier work and focused around strengthening and enhancing products and lessons developed from earlier investments. Several notable activities were initiated this year, including targeted field work in Malawi around infection control and in Southern Africa on TB in mines, implemented in collaboration with local stakeholders and already demonstrating results. The core portfolio included an array of capacity building activities, including the DR TB Learning Site, the Design to Health casebook, and the TB Refresher Course for Physicians incorporate web-based on eHealth learning systems.

The activities successfully blended the array of talents and skills brought by the consortium members and included inputs from stakeholders at the country level as well partners within the TB CARE II team. The transition between Year 4 and Year 5 activities was generally smooth, as many activities were designed to build in a stepwise manner on previous efforts. Several challenges were experienced as described in the activity reports in the following sections, most of which resulted from unexpected delays due to securing necessary approvals, i.e., for study related IRBs, government clearances, and similar challenges.

Year 5 was focused on completing current efforts and bringing projects to a point where they can be sustainable or continued through other means. A considerable focus was placed this year on developing the information and learning packages which summarize and explain the lessons gained through 5 years of implementation on these activities, and seeking out forums and opportunities to share information, materials, and products with the TB control community so that they can continue to benefit from the project's investments.

OVERVIEW

Progress and Significant Achievements

In FY 2015, TB CARE II made progress in implementation of a wide range of diverse activities according to the work plan. Main achievements of the year are summarized below:

- **TB in Mines:** TB in Mines activities are being supported in Botswana, Lesotho, South Africa, Swaziland and Zimbabwe. The overall objective is to improve detection and management of TB and other co-morbidities among the mine workers and their families, who are at high risk of TB infection. During this year, the project specifically focused on policy support and coordination to strengthen regional initiatives, incorporating a focus on small and medium sized mines, as well as support to strengthen the capacity of NTP and mining companies in management of TB and other chest diseases among miners.
- **FAST:** Implementation of FAST ended in Malawi in June 2015. The project continued to support implementation of FAST in Vietnam. FAST has contributed to significantly increase detection of unsuspected TB and RIF resistant TB cases in both the countries. The use of protocol and monitoring systems introduced by the project are integrated with the routine management of facilities.
- **Best Practices of Isoniazid Preventive Therapy (IPT) Delivery to Child Contacts and HIV-infected Individuals:** Field implementation of this study started in February 2015. Orientation of all study nurses and on-site training of staff from the five selected facilities on IPT delivery options, study protocols and tools and motivational interviewing techniques have been completed. The project has also completed selection of appropriate IPT delivery models for each site in discussion with the relevant site managers/administrators. Patient enrollment to IPT has been completed in all five facilities selected for implementation of the study.
- **Standardized Ultraviolet Germicidal Irradiation (UVGI) Fixtures:** An article entitled Institutional Tuberculosis Transmission: Controlled Trial of Upper Room Ultraviolet Air Disinfection was published in the American Journal of Respiratory and Critical Care Medicine in April 2015. The dosing draft, which will serve as the basis for the international UVGI guidelines, was completed and reviewed at a Toward International Standards for Germicidal Air Disinfection meeting that took place on May 5-6, 2015 in Bethesda, MD. Over 50 participants from the public and private sector were present. This two-day workshop focused on finalizing the guidelines and getting buy-in from stakeholders on a prepared draft guideline document.
- **Translation of Management of MDR-TB in Children:** The Sentinel Project on Pediatric Drug-Resistant TB updated the *Management of MDR-TB in Children: A Field Guide* with new dosage tables and treatment information. This 2nd Edition of the pediatric guide has been translated into Spanish and Russian; both versions were reviewed by content experts and printed in Year 5. The guides were disseminated to PIH country sites and partner organizations. The DR-TB Training Network, in partnership with the Sentinel Project, organized four webinars in Year 5 based on the contents of the guide.

- **The MDR-TB Pocket Guide:** In year 5, the programmer, working on the development of the mobile application, completed building the functionality and compiling data based on the original MDR-TB pocket guide. After review and testing, the application has been updated as needed. The final product was posted to the online Google Play store where it is available for free download. During the last quarter of the project, it was installed 81 times and received excellent reviews.
- **Building Capacity for Infection Control:** In Year 5 the Building Design and Engineering Controls for the Airborne Infection Control (AIC) course was organized by the MASS Design Group in collaboration with HSPH Department of Environmental Health, CDC, and PIH. The two-week course took place July 27-August 7, 2015, attended by 40 participants. The participants represented a wide range of institutions from the local Ministries of Health to non-profit organizations.
- **DR-TB Training Network - Learning Site:** The DR-TB Training Network is the platform for a variety of online training opportunities and also provides access to a number of publications developed by the TB CARE II project and partners. During this year, the website hosted additional live webinars and self-study activities with focus on archiving the past clinical case study discussions and making them accessible in PDF format and various languages.
- **Ethics of TB Prevention, Care and Control:** An Assessment Tool for National Tuberculosis Programs was developed, pilot tested in Namibia and Mozambique along with partners from Project Hope, revised and completed. The tool was revised based on pilot testing; changes included clearer instructions on target audience use, as well as the ability to streamline the tool for more brief use. The tool was finalized and is posted on the TB CARE II website.
- **Updated Interactive Online and Text-Based (PDF) Refresher Course for TB for Physicians:** The PDF version of the World Medical Association (WMA) TB Refresher Course for Physicians has been developed, pilot-tested and revised. Though this deliverable was completed and submitted, additional revisions are now being made to ensure consistency with the interactive online course. Programming for revisions to the online course is currently underway. The online and text-based course will be posted and disseminated when completed.

UNIVERSAL ACCESS

1.7 Improving IPT Delivery to Children and HIV contacts

A. Progress Against Expected Outcomes

The majority of the projects expected outcomes were achieved; some were delayed due to extenuating circumstances beyond program control. See below for details.

B. Activities and Result

During the period of October 2014 to September 2015, we prepared, received approval for, and initiated a healthcare delivery study to assess the impact of different delivery models for Isoniazid Preventive Therapy (IPT) to the high-risk population of HIV-infected adults on adherence and treatment completion. Throughout the project, we reviewed the medical literature to identify any relevant articles to this work. We shared a few of the most pertinent among the research team. In the months preceding the start of this project, we had submitted the necessary documents for review by both Dartmouth's Committee for the Protection of Human Subjects and for Swaziland's Ethics Committee (SEC) and received approval from both committees by October 1, 2014.

At the start of the project, our research team in Swaziland met with the relevant stakeholders, including representation from the NTP, SNAP, and URC, to review data from the systematic overview and to finalize site selection, draft study tools (e.g., training materials, patient instructions, data collection tools), and to create the study training, communication plan, and timeline. Project standard operating procedures (SOPs) were developed and members of both the Dartmouth and URC research teams conducted trainings of the staff (see training grid for details). Study sites were selected and study staff identified during November and December 2014. Training of staff and review of study protocols, procurement of supplies (filing cabinets, folders, files and other stationary), and finalization of data collection tools occurred in January and February of 2015. Meetings with site managers and administrators and decisions about which models of delivery would be offered at each site also occurred during this time. It was determined that each site would offer two delivery options, with most desiring to offer community-based or facility-based care. A major step forward was the success in coordinating IPT and ART refill pick-ups so that the patient could receive both refills at the same visit. Arrangements for transportation (car rentals) for nurses performing community-based care were made. Patient enrollment began on February 23, 2015.

The study began smoothly with excellent (approaching 100%) acceptance of IPT by the eligible patients. Dr. Lisa V. Adams made a site visit during March 15-22, 2015. During that visit, she and the Study Coordinator, Mr. Sandile Ginindza, visited each of the study sites, interviewed the study nurses on progress, and did some on-site problem-solving and corrective action. They also reviewed a random sample of the study files and identified some areas for clarification and improvement in data collection. Lastly, they met with the pharmacists at each site to ensure their engagement in the project. At the time of this visit, 632 patients (75% of target) were enrolled, with 549 selecting facility-based care and 83 selecting community-based care. Patient enrollment

continued steadily and we actually exceeded our expected enrollment of 840 patients, enrolling a total of 895 patients by August 2015.

As the study progressed, some challenges arose: there was a nationwide shortage of isoniazid tablets beginning in April 2015; incomplete documentation of IPT adherence if the patient was seen by a facility nurse other than the study nurse; and, if patients did not bring their pill bottles, there were no attempts to determine adherence by patient self-report. These challenges are discussed in more detail below.

In July 2015, we had a change in our Study Coordinator as Ms. Nonhlanhla Mahlalela assumed the role. Handover was smooth and our former Study Coordinator did an excellent job orienting Nonhlanhla to the project. Discussions also began about the likely need for a project extension at this time.

In August 2015, we started to calculate treatment outcomes and realized that up to half of our patients at all sites had incomplete data due to not bringing their pill bottles to appointments. While the preliminary analysis revealed good adherence rates for those with data, we had to take immediate corrective action. It was also determined that a project extension would be necessary in order to yield valid and meaningful results. As of September 2015, we have preliminary data and have a plan of action to address existing gaps in the data.

Table 1. Year 5 Project Training Summary

Training Title	Number Attending		Total Attending
	Male	Female	
Introduction to Motivational interviewing	5	9	14
Study Nurse Training at Ngowane Clinic	2	2	4
Study Nurse Training at Pigg's Peak Hospital	3	6	9
Study Nurse Training at Mbabane Government Hospital	4	7	11
Study Nurse Training at Ezulwini Satellite Clinic	0	4	4

C. Challenges

There were a few significant challenges in the past year of project implementation. First, in April 2015, it became clear that a nationwide shortage of isoniazid was in effect in Swaziland. South Africa was also impacted, therefore there was no immediate alternate source for this medication. As a result of this shortage, tighter control were placed on supplies and medication refills were only given in 2 week supplies. Thus, rather than their standard 2-3 month refills of medications (in coordination with their ART refills), patients were required to arrange more frequent visits to pick up their IPT refills. We anticipate this may dilute the benefit from coordinated refill pickups. In addition, 300mg tablet formulations were not available, thus patients were given three 100mg tablets to achieve the same dose, thereby increasing their pill burden. The medication shortage also impacted enrollment at the Baylor Center of Excellence site as they

were understandably reluctant to begin patients on IPT as the isoniazid shortage was becoming apparent. Fortunately, by August 2015, isoniazid supplies were being restored and patients were receiving their usual formulations and refill frequency.

In addition to the medication shortage, we learned during the follow-up site visits in March-April 2015 that many patients were being seen by nurses other than the study nurse (this would occur if the study nurse was out making home visits or simply out of the office for a day). The non-study nurses were not capturing IPT adherence data or documenting IPT refills. In addition, we learned in August 2015 (when we begin our preliminary analysis) that if patients did not bring their pill bottles for a refill, no efforts at determining and documenting IPT adherence by patient self-report were made. We discussed these issues as soon as they were identified and the Study Coordinator made several visits to try to address these issues. We also had an extended conference call on September 3, 2015 and devised a 4-pronged approach to obtain adherence and treatment completion data on all patients. This was put into effect immediately. We have continued to follow-up by email to jointly problem-solve these issues and determine the most meaningful ways to calculate treatment outcomes.

D. Next steps

Due to the unexpected national shortage of isoniazid in Swaziland resulting in delays and interruptions in care, we have requested a 7-month extension to this project to allow patients time to complete their 6-month treatment course and to enable us to calculate adherence and treatment completion results using the complete data set. Details of our proposed activities are included in the extension request documents.

E. Dissemination of Lessons Learned

Once we have the results of our IPT model delivery study, we intend to share the lessons learned widely. First, the Swaziland staff and administration will be provided an oral and written report of findings in December 2015, along with an opportunity to comment about the findings and suggest the best way forward for their own setting. Stakeholders from the NTP, SNAP and URC (both Swaziland and US offices) will also review an oral and written report. We plan to submit a poster for presentation at the next International TB Union meeting in 2016. The final results will be disseminated through USAID networks/media and will be submitted to a peer-reviewed journal for publication.

INFECTION CONTROL

3.12 Standardized UVGI Fixture

A. Progress Against Expected Outcomes

Expected outcome: published standard, high quality, UVGI unit design(s) and Standard International UVGI Guidelines for use and maintenance.

Progress: There has been progress towards this outcome but the goals have changed slightly. The overall goal of this project is to accelerate the implementation of upper room UVGI globally by addressing the following barriers:

1. A lack of usable evidence-based applications guidelines.
2. A lack of performance criteria for upper room UVGI fixtures, specifically data on total UV output per fixture and full gonioradiometry output.
3. A lack of manufacturers of quality fixtures in key application areas such as India.
4. Plans for achieving maintenance of fixtures in the field.

B. Activities and Results

Activity 1: Testing of prototype unit(s) and technology transfer

Results: Professor Wilhelm Leuschner at the University of Pretoria in South Africa has now measured the output of UVGI fixtures produced by several U.S., South African, and European manufacturers. A Dutch manufacturer has contacted Phillips Lighting, which has expressed interest in developing another laboratory for UVGI fixture testing. Egg crate UVGI has been published and presented at several meetings. Architects are planning its installation because it has the potential for an increase of approximately 7-fold in efficiency over traditional louvered fixtures. Research on LED UV continues with the major barriers being cost and power, but these are likely to improve with time.

The Harvard Fogarty engineer that has been working with Edward Nardell will move to South Africa in January to work with colleagues there to establish UV testing facilities. At the New Delhi meeting, the idea of a leasing arrangement for UVGI fixtures was discussed where a company, possibly a company already supplying equipment to hospitals (such as biological safety cabinets), would plan, install, maintain, and replace fixtures all for one monthly or annual leasing fee. It was felt that this would solve the problem of planning and maintenance expertise in hospitals.

Activity 2: Drafting of UVGI guidelines including technical plans

Results: An article entitled *Institutional Tuberculosis Transmission: Controlled Trial of Upper Room Ultraviolet Air Disinfection* was published in the American Journal of Respiratory and Critical Care Medicine in April 2015.

The dosing draft, which will serve as the basis for the international UVGI guidelines was completed and reviewed at a meeting *Toward International Standards for Germicidal Air Disinfection* that took place on May 5-6, 2015 in Bethesda, MD. This two-day workshop focused on finalizing the guidelines and getting buy-in from stakeholders on a prepared draft guideline document. The meeting was well attended by a range of industry experts along with researchers and relevant ministry authorities from the United States, South Africa, Bangladesh, India, Vietnam, Swaziland, and Russia. Generally, the objections to UVGI as unproven and unsafe have vanished. South Africa has produced a draft national guideline based on the as-yet-unpublished guidelines from the AIR facility studies in South Africa. The South African experience was well represented at the meeting, adding critical input for the potential international guidelines.

C. Challenges

No significant challenges were encountered during implementation of this activity.

D. Next steps

The key outcomes and next steps include proposing the guidelines to be adopted by an international body, developing demonstration projects for teaching and implementation, advocating for investment in UVGI practitioners, and identifying leading individuals and companies.

E. Dissemination of Lessons Learned

There was a meeting held in Bethesda, USA in May 2015 to disseminate the lessons learnt and plan for next steps. The meeting report was completed and disseminated in June 2015. Over 50 participants from the public and private sector were present.

3.13 Building Capacity for Infection Control

A. Progress Against Expected Outcomes

Expected outcome 1: IC design and engineering controls capacity building through IC summer course

Progress: In Year 5 the *Building Design and Engineering Controls for Airborne Infection Control* (AIC) course was organized by the MASS Design Group in collaboration with HSPH Department of Environmental Health, CDC, and Partners In Health. The two-week course took place July 27-August 7, 2015.

Expected outcome 2: TB Design Roster on GHDonline.org (IC consultant clearinghouse)

Progress: The TB Design Roster was launched in August 2013 on GHDonline.org and is hosted within the Infection Control Community.

B. Activities and Results

Activity 1: Train regional/local experts and mentor experts

Results: The course received over 40 qualified applicants for participation and the reviewing committee worked hard to accommodate the highest number of trainees to attend. PIH provided travel support to ten students from various countries: India, Nepal, Tanzania, Rwanda, Vietnam and Papua New Guinea. The students represented a wide range of institutions from the local Ministries of Health to non-profit organizations. The support for the students was essential, as they would not have had other funding opportunities to participate in this course and thereby gain highly valuable and applicable skills.

Activity 2: Develop clearinghouse, structure, listing criteria, and collect feedback and monitor usage

Results: The infection control consultant clearinghouse was launched in August 2013 as the TB Design Roster to link TB IC consultants with projects that need their expertise. There are

currently 46 consultant profiles with 37 viewable to members of GHDonline.org indicating these consultants are available and willing to be contacted. Various marketing steps to promote the Roster more widely via GHD Online were implemented, including a brief promotional video and a one-page overview. There were 948 page views of the TB Design Roster in Year 5.

C. Challenges

It was the first year for the MASS Design taking the lead in organizing the AIC course. The course received great reviews and feedback. However, due to delayed decision-making on the scholarship offers and travel support, some students were not able to secure a US visa in time to attend the training.

Although the TB Design Roster was launched almost two years ago, the total number of available consultants has not continued to grow. It was also not possible to monitor if any consultants have been hired through this clearinghouse via the routine metrics.

D. Next steps

This activity has been completed.

E. Dissemination of Lessons Learned

The AIC course was advertised through MASS Design website, GHD Online, DR-TB Training Network newsletter, and other partner networks. The TB Design Roster was featured in several DR-TB Training Network newsletters and was promoted by GHDonline.org in emails sent directly to its members.

3.14 Casebook for Infection Control Designs

A. Progress Against Expected Outcomes

In Year 5, MASS Design Group continued to document approaches to airborne infection control strategies within building designs in a variety of settings, and upgrades were continued to the Design to Heal web platform.

B. Activities and Results

Develop more robust processes and tools for documenting, collecting, and evaluating case study data: In preparation for the case study trips, MASS significantly restructured and reformatted the data collection templates being used to document health facilities. The questionnaire was updated to reflect lessons and observations gleaned from Year 4 activities, address a broader set of topics including the history of the facility, and serve as a more effective and user-friendly data gathering tool. The new questionnaire template was employed in conducting the Brazil, India, and Southeast Asia case studies.

Case study documentation: inclusion of additional case studies in regional focus areas. In May and June 2015, MASS Design Group conducted 3 major trips to high-burden TB areas (Brazil, India, and Southeast Asia) to document innovations in healthcare facility design and

airborne infection control. MASS conducted case studies of 13 health facilities, spanning a wide range of building typologies, climate conditions, physical contexts, and service types.

In the months prior to the trip, MASS coordinated extensively with the National TB Program (NTP) in Vietnam, and corresponding health administrators in Brazil and India, to arrange and gain administrative approval for the site visits. In many places, we were able to meet with local TB Program teams or facility staff to give presentations that provided background on MASS's work, summarized best practices for airborne infection control design, and explained the website and goals of the project in detail.

Continued upgrades to the Casebook website, and restructuring of existing visual and written content: MASS is completing efforts to refine and complete content being added to the Design to Heal website. The "Design Considerations" sections have been updated and revised; and additional write-ups for the facilities documented in Southeast Asia, Brazil, and India are currently being added to the case study portion of the site.

Advocacy + dissemination, promotion of the Casebook website as a resource for health facility design—with the ultimate goal of reaching a wider global constituency and maximizing the project's impact: MASS is presenting the Design to Heal website in the upcoming 2-week airborne infection control design course being hosted in conjunction with partners from the Harvard School of Public Health and the CDC, among other collaborators. Selected case studies from Vietnam and Brazil will be used as the topic for design workshop discussions, where students will have the opportunity to learn from existing interventions as well as propose suggested future modifications as an exploratory exercise.

C. Challenges

One of the main challenges has been identifying and coordinating health facility case studies. In spite of submitting clear TORs, some facility managers have had reservations about allowing our team to conduct evaluations out of fear that their facility may not be ideal or that it will present a poor impression of national health facilities. We have been very emphatic that the point of the case studies is to highlight innovative approaches (which can be found at every facility, no matter how modest); *not* to critique less-than-ideal scenarios. We suggest two approaches to resolving this challenge. First, we will need to work more heavily with our partners to help us reach out to in-country partners and make the right connections; personal introductions have been much more successful than cold-emailing. Secondly, we believe that showing the updated Design to Heal website and sample assessment reports to these contacts would help convince them of the utility of facilitating case studies, and garner better recognition that this could be an opportunity to showcase upgrades or work conducted that could subsequently be seen by a greater audience.

3.9 Tajikistan Demo Site

This activity was designed to demonstrate the level of TB burden due to poor Infection Control (IC) and the steps necessary to control it. Major focus was put on establishing Machiton TB Hospital as an IC demonstration and training base, documenting the magnitude of TB burden caused by poor IC, establishing effective practices/investments for its control, and building national and regional interest to propagate these advances and provide the base for training to do so. Machiton TB Hospital was selected for establishment of a demonstration and training base because of the strong pre-existing political commitment to make IC a priority in the country and improvements already made in the hospital.

A. Progress Against Expected Outcomes

Below is presented progress made at the end of project against baseline by key indicators:

Indicators	Baseline	End of Project
% of pilot key facilities (TB Centers, Hospitals and PHC) with IC focal person appointed	41%	100%
% of pilot key facilities (TB Centers, Hospitals and PHC) with IC Committee	41%	88%
% of pilot key facilities (TB Centers, Hospitals and PHC) with IC implementation plan developed	41%	88%
% of pilot key facilities (TB Centers, Hospitals and PHC) with monitoring of IC plan implementation in place	0%	71%
% of HCW from pilot key facilities (TB Centers, Hospitals and PHC) screened for TB	n/a	90%
% of HCW TB suspects from pilot key facilities (TB Centers, Hospitals and PHC) tested for TB	n/a	86%

B. Activities and Results

1. Establish Machiton Hospital, Tajikistan as an IC demonstration and training base

With technical and logistics support from the TB CARE II project, Machiton Hospital has been established as an IC demonstration and training site. An order was issued by Ministry of Health and Social Protection of Population of the Republic of Tajikistan (MOH) on the establishment of a National Center of Infection Control with training and demonstration capabilities, based in the National TB Hospital Machiton. The IC training center was equipped by the project with white boards, air conditioners, a projector and projector screen, two desktop computers, a printer, as well as IC equipment such as a GeneXpert machine and cartridges. Additionally, as cost share with the GFATM RCC 2 TB grant, telecommunication equipment was also procured and provided to be used for the conduction of webinars. Currently, the training center is fully equipped to operate.

2. Prepare National trainers on TB IC

A key objective of the project was to strengthen the institutional capacity of the hospital to plan and implement trainings on infection control. Technical support was provided to develop training of trainers (ToT) materials and develop master trainers who will serve as national resources for conducting infection control trainings. A 5-day ToT on "Tuberculosis Infection Prevention and Control" was conducted by CDC expert Paul A. Jensen and Vladimir IC Center Director, Dr. Volchenkov. Through this initiative, 14 national experts were developed as master trainers.



The project also facilitated five cascade trainings conducted by the national trainers. In total, 61 representatives of TB, PHC and SES from Sugd, Kurgan Tube, Kulyab, GBAO and Dushanbe were trained in these 3-day trainings. All teams included the deputy head of facility, chief medical nurse, TB IC focal person, laboratory specialist from TB Centers and PHC, and Epidemiologists from SES. The trainings were focused on TB infection prevention and control hierarchy, as well as on planning, prioritization, advocacy, implementation and evaluation of WHO-recommended airborne precautions for TB transmission risk reduction. All participants were familiarized with results of risk assessment in pilot facilities. During the trainings, IC plans for each pilot facility were developed by participants with the assistance of trainers. The result of the post-training test (average score of correct answers on pre-test was 34% vs.89% on post-test) showed a significant improvement of the participants' knowledge on TB IC issues.



During lectures and practical sessions, low cost and effective interventions have been discussed in detail, including: triage, cohorting, separation and isolation of highly contagious patients in in-patient and household settings; importance of rapid diagnostics and early effective TB treatment; risk assessment; zoning of a facility according to TB transmission risk level; and other applicable administrative measures. Special sessions have been dedicated to environmental controls, including natural and mechanical ventilation, and ultraviolet germicidal irradiation (UVGI).

Pre- and post- training tests clearly showed that after the training participants were able to perform TB transmission risk assessments, to develop priority and available resources based plans, to perform assessments of ventilation parameters, measure UVGI and assess effectiveness and safety of UVGI installation, conduct a respirator fit test, and build and evaluate the laboratory biosafety program in TB laboratory.

C. Challenges

1. TB screening/testing and reporting among HCWs was a major challenge. Health facility employees prefer to conceal their diagnosis, since established TB diagnosis means loss of employment and salary without any benefits for treatment or social support. This explains why HCWs generally prefer to be tested and treated anonymously. Coupled with the poor recording and reporting mechanism in the system for registration of TB cases among HCWs, this creates issues in collecting reliable and valid data on TB among HCWs.
2. Although TB IC National Guidelines were introduced by the MoH in 2011, many epidemiologists are not familiar with its requirements and do not use it in their work. This is partly due to high employee turnover and insufficient training of current staff. TB IC trainings/refresher trainings are required to address this issue and special forms need to be developed to regulate actions of epidemiologists.
3. The country is experiencing a severe shortage of engineers serving TB IC technical equipment, including biosafety boxes, which contributes to poor IC in the facilities even if they have knowledge and theoretical capacity to implement proper IC measures.

D. Dissemination of Lessons Learned

The project held regular meetings with national health authorities and international partners to share and discuss project challenges and achievements. Also, project reports were submitted to the NTP and MOH for their information and consideration.

PMDT

4.19 Translation of Management of MDR-TB in Children: A Field Guide

A. Progress Against Expected Outcomes

Expected outcome: Translation of *Management of MDR-TB in Children: A Field Guide*

Progress: the Sentinel Project on Pediatric Drug-Resistant TB updated the *Management of MDR-TB in Children: A Field Guide* with new dosage tables and treatment information. This 2nd Edition of the pediatric guide has been translated into Spanish and Russian; both versions were reviewed by content experts and printed in Year 5. The guides were disseminated to PIH country sites and partner organizations.

B. Activities and Results

Activity 1: Translation, editing, printing, and dissemination of the guide in Spanish and Russian.

Results: The guide was translated into Spanish and Russian and printed. Content experts reviewed the accuracy of the translation and a professional designer was hired to create a similar layout to the original English version. Due to high demand, additional English copies were also printed reflecting the updated dosing information and other minor edits.

Activity 2: Webinar conducted to promote/disseminate the guide.

Results: the DR-TB Training Network, in partnership with the Sentinel Project on Pediatric Drug-Resistant TB, organized four webinars in Year 5 based on the contents of the guide. There were 105 unique participants, the majority of whom were representing countries from the Americas and Asia. More details are available in the Appendix.

C. Challenges

The greatest challenge to-date remained ensuring the accuracy and clarity of the translated content and the reflection of edits across all the translated versions. The proofreading step of the process took longer than anticipated.

D. Next steps

This activity was completed.

E. Dissemination of Lessons Learned

When completed, the guides were disseminated via the DR-TB Training Network website, the Sentinel Project website, and via TB CARE I and II partners. The guides were made available in multiple formats including print, PDF, and as online e-Books.

4.21 Mobile Application: “The MDR-TB Pocket Guide”

A. Progress Against Expected Outcomes

Expected outcome: Android and/or iPhone compatible mobile application based on the MDR-TB pocket guide published in Year 4.

Progress: In year 5, the programmer working on the development of the mobile application completed building the functionality and compiling data based on the original MDR-TB pocket guide. After this, the application was reviewed and tested internally, which helped to identify potential issues. Certain updates and improvements were implemented accordingly. The application was submitted to URC and approved for wider dissemination.

B. Activities and Results

Activity 1: Mobile app developed.

Results: The mobile app development was completed. As planned, the app includes tables and other information from the original MDR-TB pocket guide, useful for quick reference. The application is currently compatible only with Android devices.

Activity 2: Mobile app disseminated.

Results: The final product was posted to the online Google Play store where it is available for free download. During the last quarter of the project, it was installed 81 times and received excellent reviews.

C. Challenges

Since the current mobile application is only compatible with Android devices, the development of an equivalent application for smartphones using the iOS platform was desired. However, due to time constraints, it was not completed.

D. Next steps

This activity was completed.

E. Dissemination of Lessons Learned

The application is available as a free download via the online Google Play store. It was promoted via the DR-TB Training Network website and via partner networks. Recently, it was selected as one of the featured “Additional Resources” for the October 2015 Find TB Resources Website E-Newsletter.

4.22 Drug-resistant TB Training Network - Learning Site

A. Progress Against Expected Outcomes

Expected outcome: DR-TB Training.

Progress: The DR-TB Training Network is the platform for a variety of online training opportunities and also provides access to a number of publications developed by the TB CARE II project and partners. In the final year of the project, the website hosted additional live webinars and self-study activities. There was a focus on archiving the past clinical case study discussions and making them accessible in PDF format and various languages. Several publications focused on the management of DR-TB were translated and made available via the site.

B. Activities and Results

Activity 1: Continuation of the clinical case discussion started in Y1.

Results: In Year 4, the case discussion series hosted by the DR-TB Training Network concluded with 34 cases covering a variety of clinical and psychosocial topics relevant to the treatment of DR-TB. In the final project year, all case studies were archived as PDF documents, available for training purposes. Each case study was translated into Spanish, French and Russian. Case studies were downloaded 178 times during Year 5, and 396 times over the course of the whole project.

Activity 2: Continuation of the online learning activities including webinars and self-study tools.

Results: The DR-TB Training Network hosted nine webinars in Year 5 and there are now seven self-study activities. There were four webinars focusing on pediatric DR-TB topics and five on Hot Topics in DR-TB treatment and management. All webinars were hosted in English. More webinar data can be found in the Appendix; below are the highlights:

Table 1: Highlights of the activities

Webinars	No.	Participation Events	Unique Individuals	No. of Countries Represented	YouTube™ views after live event (as of 03/17/14)
Pediatric DR-TB (English)	4	123	105	31	243
Hot Topics in DR-TB (English)	5	252	141	35	421
TOTAL	9	375			664

The seven self-study activities have been viewed 725 times in total with the *Latent Tuberculosis – the most important facts for healthcare workers* being the most popular with over 200 views alone.

C. Challenges

The main challenge for a resource such as the DR-TB Training Network is that its target group, TB practitioners in resource-limited, high-burden TB settings, may not have access to the internet or if they do, it is often a low-bandwidth connection or cost-prohibitive for participation in live webinars. The online learning activities such as the live webinars and self-study activities require constant access to the internet to participate, which is a limitation. Other tools such as the case studies and publications are available to download for offline use. To increase access to the contents of the webinars, the presentations are available to download and videos have been shared offline via external hard drives, when possible.

The resources of the website are also mainly offered in English, which limits access; efforts were made throughout the project to translate more of the content and offer webinars in additional languages. Some of the resources have been translated, but not necessarily adapted to a particular context. Programs wishing to use these materials may still need to update the images and contextualize some of the content.

D. Next steps

The activity was completed.

E. Dissemination of Lessons Learned

After the end of the project, the activities and resources developed will remain available via the DR-TB Training Network website for another six months. A final newsletter sent out to all subscribed members informed them of the end of the project and encouraged them to download resources of interest. All webinars were archived to YouTube™ and will remain accessible online. The FIND TB Resources Newsletter highlighted the mobile application developed by TB CARE II project in the last quarter of Year 5, which drove additional traffic to the DR-TB Training Network website.

TB/HIV

5.1 Identify best practices for early initiation of ART for TB patients

A. Progress Against Expected Outcomes

Work on this activity was undertaken by TB CARE II team including URC, GTBI, and Jhpiego with significant contributions from TB CARE I (the Union) specifically related to identifying best practices developed in Zimbabwe.

B. Activities and Results

The project has completed drafting and reviewing the framework for best practices to improve early initiation on ART for TB patients.

C. Challenges

No significant challenges were experienced.

D. Dissemination of Lessons Learned

No dissemination has taken place so far; following completion of the best practice framework, the TB CARE II will aim to disseminate the findings widely.

HEALTH SYSTEMS STRENGTHENING

7.2.2 Create tools to enable annual strategic planning review/evaluation and build capacity of NTP to carry out these activities

A. Progress Against Expected Outcomes

The *Ethics of TB Prevention, Care and Control: An Assessment Tool for National Tuberculosis Programmes* was developed, pilot tested in Namibia and Mozambique along with partners from Project Hope, revised and completed.

B. Activities and Results

The pilot testing of the ethics tool was completed in Namibia and Mozambique along with partners from Project Hope, Inc. This included a number of stakeholders from the Ministry of

Health levels as well as district and provider levels. Both programmes provided positive feedback on the tool. The tool was revised based on pilot testing; changes included clearer instructions on target audience use, as well as the ability to streamline the tool for more brief use. The tool was finalized and is posted on the TB CARE II website.

C. Challenges

Because of the sensitive nature of ethical practices, delays occurred due to obtaining required approvals for pilot testing. Additionally, the nature of pilot testing took valuable time of practitioners in the field, so finding optimal time for meeting with them was an issue. However, appropriate buy-in and stakeholder participation made the pilot testing more valid and well worth the wait.

D. Dissemination of Lessons Learned

The lessons learned and ethical challenges identified during pilot testing were used to inform Activity 6.2, development of the *Ethics of TB Prevention, Care and Control* training curriculum. Use of the tool is included in the training, and the curriculum and tool will be marketed and disseminated together once final approval for the training curriculum is received.

6.2 Ethical TB Patient Management Training

A. Progress Against Expected Outcomes

A curriculum for a two-day training on Ethics of TB Prevention, Care and Control including facilitator-led training guide, slide sets, and activities has been completed.

B. Activities and Results

A one-day training was developed based on WHO Ethics Guidance and findings from the pilot testing of the ethics tool (Activity 7.2.2). The training included lectures and interactive activities, which were reviewed by varied GTBI and URC staff and select external reviewers. A draft facilitator guide was also developed. GTBI and URC collaborated to plan pilot testing of the one-day training, which took place on June 3, 2015 in East London South Africa for health care workers in the Eastern Cape Province. Presenters included GTBI and URC staff as well as provincial staff. An observer from the NTP also attended. The training was well reviewed and based on feedback from presenters and attendees, the training curriculum was revised and extended into a two-day course. Following the revisions, the revised course content and facilitator-led training guide were reviewed by content and training experts from GTBI, the Union, and CDC. The curriculum was revised and finalized based on this review and feedback and submitted to URC for submission to USAID. The curriculum page is ready to be made "live" on the GTBI website, pending final approval. Planning for dissemination is underway and will commence when approval is received.

C. Challenges

Because of the sensitive nature of ethical practices, delays occurred due to obtaining required approvals for pilot testing of the ethics tool on which the training curriculum was based. This subsequently delayed the start of the training curriculum development. The WHO is in the

process of developing new ethics guidance for TB, but since this process is not yet complete, the curriculum is based on the existing WHO guidance from 2010.

Next steps

Once final approval is received, the course will be made “live” on the GTBI website and marketing and dissemination will take place. The course will be presented at the November 2015 meeting of the WHO’s Ethics Guidance Expert Group Meeting and will be disseminated to WHO, the Union group Ethics, Advisory Group, the World Medical Association, and other organization. The course will also be available on the GTBI and TB CARE II websites and will be marketed in the GTBI newsletter, social media efforts, and to CDC’s TB Education and Training Network. Additional projects to build on these efforts have been proposed for the continuation of the TB CARE II project. These include including revising the course when new WHO ethics guidance is released, implementing a series of workshops at WHO Regional and National TB Programme Managers’ meetings on the *Ethics Assessment Tool*, offering the *Ethics of Tuberculosis Prevention, Care and Control Training Course* in key locations to be identified by partners and development of an online course based on content of the *Ethics of Tuberculosis Prevention, Care and Control Training Curriculum*, that would include videos, case studies, and other interactive features.

D. Dissemination of Lessons Learned

The course will be disseminated online and marketed to multiple organizations. A flyer will be developed for distribution at the Union World Conference in South Africa in December, and abstracts will be submitted for upcoming TB conferences.

1.6 Updated Interactive Online and Text Based Refresher Course on TB for Physicians

A. Progress Against Expected Outcomes

The PDF of the World Medical Association (WMA) TB Refresher Course for Physicians has been developed, pilot-tested and revised. Though this deliverable was completed and submitted, additional revisions are now being made to ensure consistency with the interactive online course. The interactive online WMA TB Refresher Course for Physicians has been developed based on content drawn from the PDF. The course has undergone usability testing and expert review, and revisions were made.

B. Activities and Results

The project began with a thorough review of the existing course and relevant guidance documents from WHO and other international organizations to identify areas of the course that should be updated. This included data and statistics, areas where guidelines have changed, revisions to the diagnosis section to include GenXpert, emphasis on patient-centered care and inclusion of information on palliative care and ethics. Additional needs assessment and solicitation of pilot testers for both the PDF and online courses was conducted at the Union World Conference in Barcelona in 2014. A draft of the course content was created and thoroughly reviewed by clinicians at GTBI. After revisions based on internal review, the text-based course was graphically designed and pilot tested by physicians who had been identified at

the Union Conference. Pilot testing suggestions were analyzed and revisions made. Briefly, revisions after pilot testing included adding information on TB and Diabetes and TB and Mental Health, and changing the order of some content. The PDF course was then finalized.

Development of the content for the interactive online course was initiated concurrently with revisions to the text-based course. The content was reviewed by GTBI content experts and, following revisions, usability testing and external expert review was conducted in August. Feedback was received from physicians in the field in multiple countries and from content experts at CDC, WHO and other organizations. There were useful and detailed comments received, which resulted in reorganization and revision of some text. Therefore, a decision was made to revise the PDF as well.

C. Challenges

Incorporation of GeneXpert into the diagnosis section required care and attention, since some countries are utilizing this technology and others are not. Additionally, different countries have different criteria and guidelines for when the test should be used. Since the course is designed to be applicable in many settings, care was needed to be general enough to be widely used, but specific enough to be of use, while still being clear and understandable. Further, the Post 2015 Global TB Strategy was in development and the final content was needed for incorporation into the revisions.

Additionally, though the expert reviewers for the interactive online course provided detailed and beneficial feedback, there was a delay receiving these comments. Furthermore, the programming revisions that needed to be made took longer than expected. Finally, since some of the feedback impacted content and organization, changes to the PDF version were also required. All of these delayed the completion of the project.

D. Next steps/ Implications for Year 5 Activities

This project received a no-cost extension and will be completed in fall of 2015. The PDF and interactive online courses will be finalized and can be widely marketed and disseminated, including to TB CARE II partners at the country level. Additional projects to build on these efforts have been proposed for the continuation of the TB CARE II project. This includes development of a Washington Manual (concise and easy to read online and print pocket guide) for use in practice settings based on key information from the *TB Refresher Course* and Development of an app of the WMA *TB Refresher Course* for Android and Apple devices to allow physicians to access the course even in areas where reliable internet access is not available.

E. Dissemination of Lessons Learned

WMA and GTBI will promote the course using various channels including their websites, newsletters and social media, including Facebook and Twitter. WMA will also promote to their active junior doctor network and with the International Federation on Medical Students' Associations (IFMSA). WMA will promote the course at their next general assembly in October in Moscow. The training can also be promoted using CDC's TB Education and Training Network, The Union's Regional and World Conferences on Lung Health) and

listserves/announcement lists (e.g., GHD online TB Wire, Find TB Resources, Stop TB Partnership). Partner websites can also link to the training.

6.3 Insurance Tool Kit

A. Progress Against Expected Outcomes

This activity was focused around the Philippines quality assessment. Progress was smooth - the study protocol was finalized in January with assistance from NTP, PhilHealth, PhilCAT, regional managers, USAID and the IMPACT project. Mystery clients were recruited and trained in all three regions and data collection started in early March. All data had been collected and draft findings developed. A meeting to disseminate and validate findings was held in April, in Bangkok.

B. Activities and Results

Activity 1: Manual on TB service integration within NHI programs adapted in two countries – A framework document from the Bangkok meeting was finalized and disseminated. It is available at <http://tbcare2.org/content/tb-care-ii-hosts-insurance-meeting-bangkok>

Activity 2: Activities were focused on finalizing the 2nd round of data collection for the TB quality assessment in the Philippines. Data was completed in all 3 sites on June 20 and all data analysis was completed. Assessment report of the quality of TB care through health insurance in the Philippines has been finalized.

C. Challenges

The organization and set up of the workshop in Bangkok had a series of associated organizational challenges, but nothing of significance. Not all intended participants were ultimately available for a variety of reasons, but the workshop was successful overall.

D. Dissemination of Lessons Learned

Dissemination of lessons and findings is a critical component of this activity. The project is seeking every opportunity to engage more and more diverse stakeholders in discussions regarding the findings of the case studies, both through our international networks and through URC's field programs.

Vietnam FAST Activity

Background

Vietnam currently ranks 12th among the world's 22 high burden TB countries, with an estimated incidence rate of 144 cases per 100,000 population. The case detection rate for all forms of TB is 76%. The estimated burden of MDR TB is 4% among new (approximately 3000 cases) and 23% among retreatment cases (approximately 2100 cases). In 2013, there were 1204 laboratory

confirmed cases of MDR TB, of which 948 cases were enrolled on treatment, meaning that more than 75% of estimated MDR TB cases were not diagnosed and enrolled on treatment.

Quang Nam Province is located in the South Central Coast region of Vietnam, 821 km from Hanoi. The province has two cities, Tam Ky and Hoi An, and 16 districts. With a population of approximately 1.4 million, it reports 1,600 cases of TB annually. Approximately 70% of TB cases were diagnosed and initiated treatment at Quang Nam Provincial Hospital of TB and Lung Disease (PHTB&LD) with a 182-bed capacity. However, most of those cases were transferred to district TB control teams for registration and reporting to the NTP. The PHTB&LD has served as an MDR TB treatment initiation site with 8-bed capacity since 2011. In October 2013, a four-module Xpert MTB/Rif machine and cartridges, supported by UNITAID, was installed at the PHTB&LD. Turnaround time from specimen collection to notification for drug sensitive and resistant TB has subsequently dropped from 10 days to approximately 2 days.

Nam Dinh is also a coastal province, located in the Red river Delta in the North of Vietnam, 90 km from Hanoi. The province has one city, Nam Dinh, and 9 districts. With a population of approximately 1.8 million, it reports 1,900 cases of TB annually. Nearly a half of all TB cases was diagnosed at the PHTB&LD with 160-bed capacity. Most of those diagnosed TB cases were registered and reported to the NTP by Nam Dinh PHTB&LD. Therefore, management of TB cases diagnosed at Nam Dinh PHTB&LD is stricter than that in Quang Nam PHTB&LD. Nam Dinh PHTB&LD sent specimens of MDR-TB suspects to reference labs in Hanoi for MDR TB detection. Average turn-a-round time from specimen collection to test result receipt is about 7 to 10 days, sometimes longer due to shortage of test kits. Serving as an MDR TB treatment initiation site with 8-bed capacity since 2011, the PHTB&LD initiates treatment based on the received test results for MDR TB patients. Nam Dinh PHTB&LD received a 4-module Xpert machine from support of the Global Fund Round 9 Phase 2 in late November, 2014.

Introducing FAST strategy

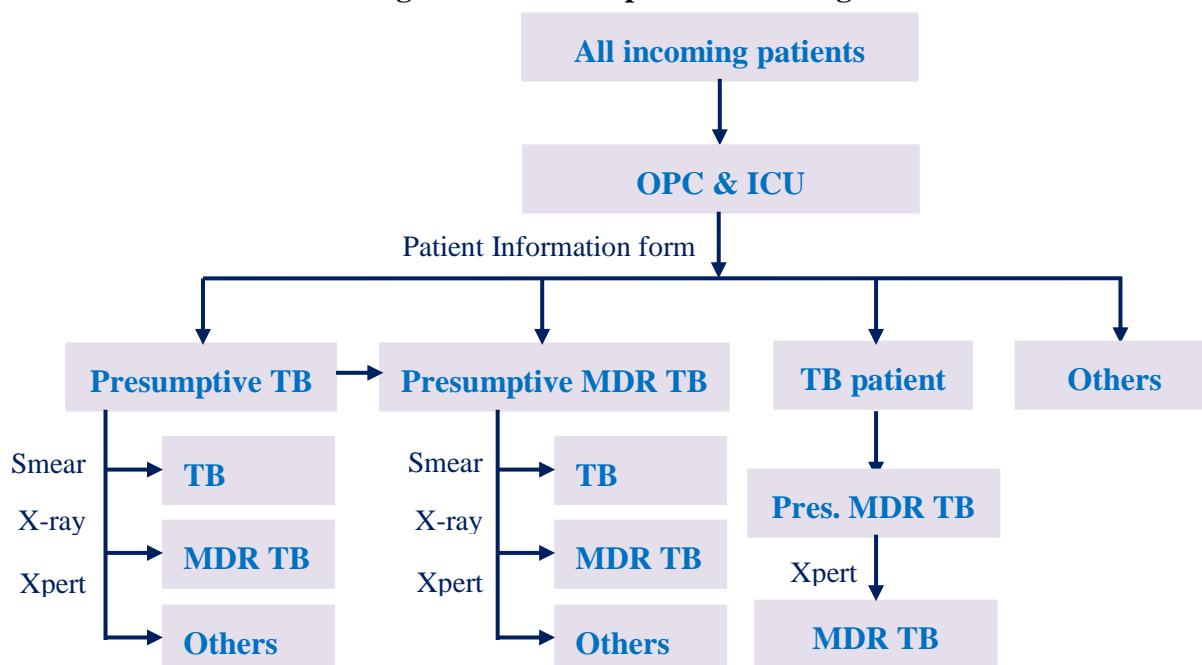
In order to detect and diagnose TB and MDR TB cases early for effective treatment initiations, the USAID TB CARE II Project assisted in introducing the *FAST* strategy in Quang Nam and Nam Dinh PHTB&LD in early 2014. *FAST* stands for **F**inding TB and MDR TB suspects **A**ctively, **S**eparating them safely, and initiating effective **T**herapy early. The *FAST* strategy is an infection control strategy aimed at reducing TB transmission among both health care workers and patients in the healthcare facilities and in the community. The objectives of *FAST* strategy implementation are to: 1) strengthen patient screening and triaging at the hospital's outpatient department (OPD) and intensive care unit (ICU) in order to identify TB and MDR-TB suspects; 2) use Xpert technology to rapidly detect and diagnose TB and MDR TB cases for early and effective treatment initiation; and 3) strengthen patient tracking and management system to manage TB and MDR TB cases more effectively.

Key Activities

Reduced infection transmission at OPDs and ICUs: Masks were continuously provided to patients visiting OPDs and ICUs – points of entry which are usually crowded with undiagnosed and unsuspected cases and people with other diseases - at both PHTB&LD to reduce dispensing TB and MDR-TB into the air.

Improved screening and triaging of visiting patients: Following the implementation algorithm in Figure 1, all incoming patients to both the OPD and ICU were actively screened using a patient information form to capture and document patients' hospitalization history, previous TB treatment, exposure, symptoms, and lab tests from referring facilities. Patients were divided into four main categories: presumptive TB, presumptive MDR-TB, TB patient, and others for appropriate test requests, and triaged to the appropriate clinical wards for follow up. Presumptive MDR-TB patients were given priority to get Xpert test. Presumptive TB patients including children, adults and HIV-infected people were also get access to Xpert for quicker and higher accurate diagnosis. FAST provided the two PHTB&LD 4,000 Xpert cartridges and 1,200 falcon tubes to support Xpert tests for presumptive MDR TB and TB.

Figure 1: FAST implementation algorithm

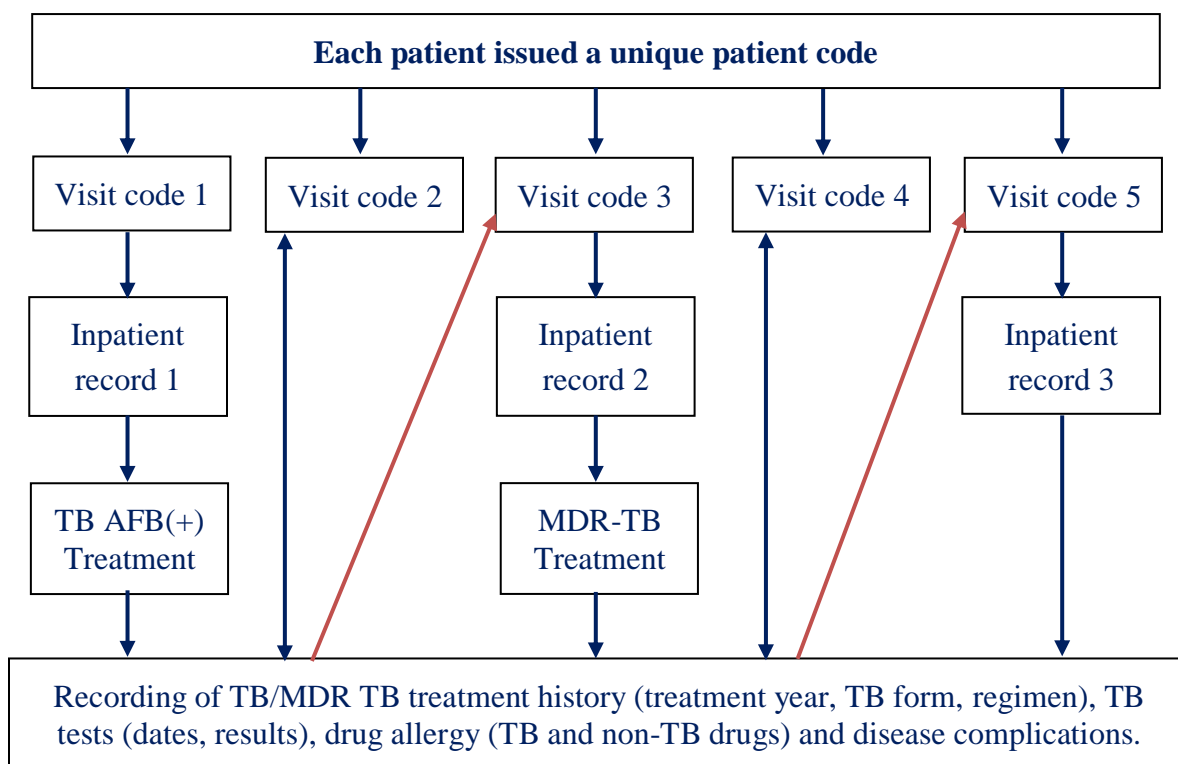


Patient recording, tracking and reporting system: A simple MS Access database was quickly designed by URC staff to record, track and report visiting patients at the starting up of FAST implementation. All patient information forms, once filled out by OPD and ICU staff, were entered into the database. On a monthly basis, database records were merged with other existing data recording systems maintained by different hospital departments (i.e. inpatient records, Xpert log books, Medisoft, Vitimes etc.). Such data merging created more complete records of patient

information in the MS Access database and allowed to track patients from registration at the points of entry to the discharge. The MS Access databases generated reports for monitoring FAST implementation, PPM reports and feedbacks to referring facilities, and other hospital reports for supervision, significantly reducing the burden of report preparation, which were manually done prior to the intervention.

With great experience obtained from using the simple MS Access database, and with FAST Project support, more comprehensive hospital software to improve patient information management and rapid patient classification and accurate diagnosis were developed and deployed at the both PHTB&LD, supporting implementation of the FAST strategies. The hospital software allows all departments to access to patient records on a network. OPC and ICU staff had to search the hospital software to find out if the patient had been seen at the PHTB&LD. The returning patients will use the unique code granted to them at their first visits. Staff will be able to use the unique patient code to retrieve previous visits and hospitalization episodes of the patient including histories of TB exposure, symptoms, lab tests, diagnosis and treatment and their associated dates, main diagnosis, disease complications and drug allergy (Figure 2).

Figure 2 –Link visits and hospitalization episodes of the same patients using unique patient code



Such instant access to the patient information assisted doctors in making quicker patient classification, identifying the appropriate tests needed, and providing a more accurate diagnosis

and effective treatment in compliance with the FAST strategy. Additional patient information from the current hospitalization episodes was asked and directly entered into the software. Management of TB, MDR-TB and other chronic lung diseases such as asthma and COPD were added to the software for effective patient information management and more completeness of patient records. The software was planned to generate patient logbooks and reports for the National TB program, reducing a great burden of hand-writing logbooks and manual counts for reports with more accuracy and completeness.

Capacity strengthening: Staff capacity was continuously strengthened to implement and monitor the FAST activities and manage and utilize patient data through training and technical assistance during monitoring trips (Table 1). Both Nam Dinh and Quang Nam PHTB&LD staff gained some experience with simple MS. Access database. Intensively hand-on training on deployment of the hospital management software was provided to all range of the staff at the hospitals.

Table 1: Capacity strengthening

Type of Training	Type of Participants	Number of participants		Total number
		M	F	
Nam Dinh PHTB&LD				
Training course “Protocol on collaboration among hospital departments to request Xpert for TB and MDR-TB diagnosis”	Directors, doctors, nurses, pharmacists, medical technicians and financial staff.	12	15	27
Deployment of the hospital management software	Directors, doctors, nurses, pharmacists, medical technicians and financial staff.	15	20	35
Quang Nam PHTB&LD				
The 03rd training course on MS Access Database	Doctor, assistant doctor, nurses and public health officers from the OPD-General Planning-Network Direction Department	6	4	10
The 04th training course on MS Access Database	Assistant doctor, nurses and public health officers from the OPD-General Planning-Network Direction Department	4	2	6
Training course “Protocol on collaboration among hospital departments to request Xpert for TB and MDR-TB diagnosis”	Directors, doctors, assistant doctor, nurses, pharmacists, technicians, public health officers, administration and financial staff.	19	6	25

Type of Training	Type of Participants	Number of participants		Total number
		M	F	
Training course “Improve the chest radiography technical and introduce Gene expert”	Directors, doctors, assistant doctor, nurses, pharmacists, technicians, public health officers, administration and financial staff.	17	8	25
Deployment of the hospital management software	Directors, doctors, assistant doctor, nurses, pharmacists, technicians, public health officers, administration and financial staff.	31	46	77

Monitoring and Evaluation: URC/TB CARE II staff paid field visits to both Nam Dinh and Quang Nam PHTB&LD to monitor activity implementation, participate in monthly meetings to review performance, discuss solutions to issues and provide on-site technical assistance. Each PHTB&LD organized routine meetings to review and improve quality of form completion, improve data quality, utility and exchangeability, and strengthen collaboration among departments.

Meetings and Conferences:

The annual join meetings for the two PHTB&LD and URC were conducted to review and share experience of FAST activity implementation:

- The first annual review meeting for the Fiscal year 2014 was conducted on December 16, 2014 in Tam Ky, Quang Nam province.
- The second annual review meeting for the Fiscal year 2014 was conducted on September 11, 2015 in Nam Dinh province.

Study tours to exchange hand-on experiences between partners:

- During the trip to Quang Nam, the Nam Dinh PHTB&LD leaders and staff visited and observed how the Quang Nam PHTB&LD was operated and learned experience of Xpert implementation. Nam Dinh PHTB&LD staff made direct observation of Xpert machine operation and practiced specimen preparation. The Nam Dinh PHTB&LD gained great hand-on experience for well starting up Xpert operation at their hospital in January 2015.
- Quang Nam PHTB&LD gained some experience with simple MS. Access database designed by URC/TB CARE II staff since 2014. The Quang Nam PHTB&LD and URC staff paid a study tour to the National Lung Hospital, which had great experience with using the hospital patient management software for more than a decade. The study tour provided insights of the software structure and great management experience at the National Lung hospital.
- During the trip to Nam Dinh in September 2015, the Quang Nam and Nam Dinh PHTB&LD shared experience of their hospital software development and deployment. The two

PHTB&LD and URC discussed about application of the hospital software to monitor and detect, diagnose and initiate treatment for TB and MDR-TB patients in the coming time in compliance with FAST strategy.



Exchanging experience of the hospital software deployment in Sep 2015



Training on MS Access database in Quang Nam 2015

Sharing experience on FAST implementation for scaling up in Vietnam:

- FAST implementation in Vietnam was also orally presented and discussed with the NTP director and key staff regarding scaling up FAST strategy at the National Lung Hospital and in other provinces in Hanoi on May 22 and June 5, 2015.
- FAST implementation in Vietnam and the NTP's FAST strategy scaling plan were also orally presented and discussed with the USAID and CDC representatives at the USAID mission's office in Hanoi on June 9, 2015.
- FAST implementation in Vietnam was orally presented and discussed with TB program representatives from National level and 63 provinces and their partners at the Semi-Annual TB Review Meeting on August 21, 2015. The National TB Program recommended the provincial TB programs flexibly applied FAST strategy into their specific context.
- URC/TB CARE II staff actively approached and discussed with the NTP about electronically exchanging data files between the PHTB&LD and the National TB/MDR-TB databases. The PHTB&LD staff has been conducting data entry of direct sputum smears, presumptive MDR TB, TB and MDR-TB patients into the web-based National TB/MDR-TB databases. Successful implementation of this innovative intervention will let the PHTB&LD conduct data entry into only one database – the hospital software, resulting in increasing data quality and consistency and reducing typo errors and manpower for data entry into different databases.



FAST presentation at the Semi-Annual TB Review Meeting on August 21, 2015, Photo by Lien Nguyen

Sharing experience on FAST implementation widely shared with partners and colleagues at international meetings/ conferences:

- The 45th World Conference on Lung Health in Barcelona, Spain in November 2014.
- The meeting regarding “Lessons from the Implementation of the FAST Strategy” in Washington DC on May 7-8, 2015.

Results

Thousands of visiting patients were screened with the patient information form at the OPD and the ICU. This daily use of the patient information form improved skills and habits of staff on asking and using such important patient history and symptoms to improve doctors’ patient classification, appropriate test requests and better diagnosis at the OPD and ICU. Table 2 shows numbers of incoming patients screened with the form to identify presumptive TB and MDR-TB cases and those diagnosed with the diseases at Nam Dinh PHTB&LD from April 2014 to September, 2015.

Table 2: Monitoring indicators in Nam Dinh PHTB&LD in the period of April 2014 to September, 2015

No.	Indicators	2014			2015		
		Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
1.	No. of patients screened with a patient information form	1254	1186	1115	1088	1519	1187
2.	No. of presumptive TB cases identified	681	932	956	954	1369	1090
3.	No. of presumptive MDR-TB cases	11	17	23	70	18	19

No.	Indicators	2014			2015		
		Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
	identified						
4.	No. of Pulmonary TB patients diagnosed	203	185	113	126	187	167
5.	No. of MDR-TB patients diagnosed	12	9	8	11	11	18

The number of Xpert tests increased from 1,077 for 8 months from May to December in 2014 to 1,940 for nine months from January to September in 2015. This contributed to the increased number of pulmonary TB patients diagnosed in 2015 compared those in the same quarters of 2014 (Table 3). Presumptive MDR-TB cases were given priority to Xpert test. The much higher number of Xpert tests with lower number of MDR-TB patients diagnosed in 2015 suggested a reducing tendency of MDR-TB patients in this province.

Table 3: Monitoring indicators in Quang Nam Dinh PHTB&LD in the period of May 2014 to September, 2015

No.	Indicators	2014			2015		
		May-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
1.	No. of patients screened with a patient information form	1417	2256	2473	2328	2459	2794
2.	No. of presumptive TB cases identified	1189	1624	1638	1419	1401	1640
3.	No. of presumptive MDR-TB cases identified	8	138	377	405	339	215
4.	No. of Pulmonary TB patients diagnosed	146	201	188	208	268	253
5.	No. of MDR-TB patients diagnosed	8	9	11	2	7	7

Access to Xpert testing on site significantly increased MDR TB case detection and shortened turnaround time (TAT) from when samples were sent for testing to when patients were initiated on treatment. Table 4 below shows the number, method of diagnosis, and TAT for MDR TB patients from 2011 through September 2015. With improvements in rapid testing technology and more intensified case finding, the average TAT has decreased from 125 days to 7 days.

Table 4: Early diagnosis and treatment with Xpert in Nam Dinh PHTB&LD

Indicator	2011	2012	2013	2014	9 months of 2015
Testing site	In other provinces				On site (FAST)
Method of diagnosis	Hain	Hain	Xpert	Hain	Xpert
Number of MDR TB patients diagnosed	20*	12	9	22	24
Number of MDR TB patients treated	14	12	8	22	24
Average TAT from specimens sent to treatment initiation (days) (median)	125.6 (110.0)	25.3 (19.5)	12.1 (13.5)	14.8 (13.5)	38.2 (21.0)

* Six patients died prior to the treatment initiation

** Three patients were tested in other provinces

Similar to Nam Dinh PHTB&LD, access to Xpert testing on site significantly increased MDR TB case detection and TAT in Quang Nam. Table 5 below shows the average TAT has decreased from 121 days to 6 days.

Table 5: Early diagnosis and treatment with Xpert in Quang Nam PHTB&LD

Indicator	2011	2012	2013	2014		2015
				Jan-Apr	May-Dec	Jan-Sep
Testing site	In other provinces			On site	On site (FAST)	
Method of diagnosis	DST* and Hain	Hain	Xpert	Xpert	Xpert	Xpert
Number of MDR TB patients treated	8	15	16	13	25	16**
Average TAT from specimens sent to treatment initiation (days) (median)	121.0 (151.5)	32.7 (25.0)	11.1 (9.5)	10.6 (6.0)	6.2 (4.0)	5.6 (5.5)

* Drug susceptibility testing

** One patient was transferred to another province.

Challenges

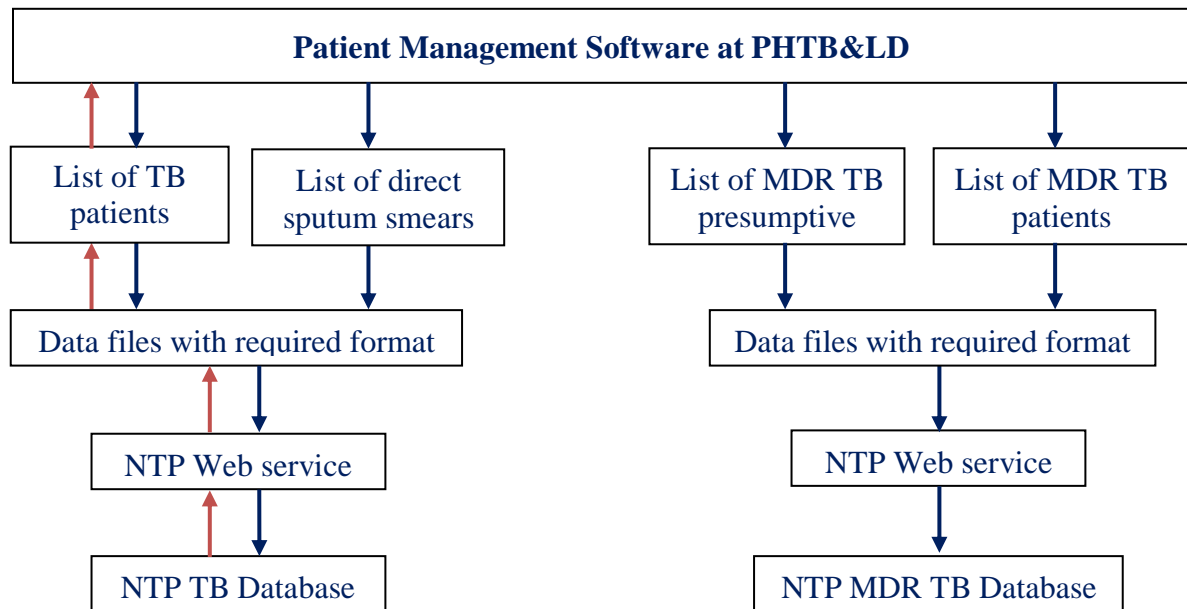
- Shortage of manpower works for both PHTB&LD. Each staff has multiple duties.
- Both PHTB&LD lacked of staff competent with the hospital software management and data monitoring, analysis and utility. PHTB&LD assigned staff to take additional duties as the administrator of the hospital software.
- The software used at hospitals for data management was not designed to record, monitor and report diseases for specialty services such as TB, MDR TB, asthma, and COPD. Both Nam Dinh and Quang Nam PHTB&LD were new to the hospital software. TB CARE II staff

discussed this issue with the management of hospital and the software companies to modify the software. TB CARE II staff closely monitored and coached the process of designing windows for data entry and patient logbooks for recording and managing TB, MDR TB, asthma, and COPD in the hospital software.

Next steps

- In discussion with NTP, the project plans to expand the technical scope of the application to generate patient logbooks and report for the TB and Lung disease programs. This application will greatly reduce burden of hand-writings on logbooks and manual counts for reports.
- The project will support NTP with implementing systems to enable electronically exchange data files between the PHTB&LD and the National TB/MDR-TB databases will be an innovative intervention (**Figure 3**) and will significantly improve data quality and consistency and reducing typos and manpower needed for data entry into different databases.

Figure 3 – Exchange of data files between the PHTB&LD and the National Databases



- Capacity strengthening: Continue to strengthen capacity to expand implementation of the FAST strategy and manage and utilize patient data through training and technical assistance.

Dissemination of Lessons Learned

- FAST implementation in Vietnam was presented as a case study in a WHO's online document "[Best practices in engagement of health care providers in programmatic management of drug-resistant tuberculosis](http://www.who.int/tb/publications/public-private-mix-drug-resistant-tb/en/)", published in September, 2015, available at this link <http://www.who.int/tb/publications/public-private-mix-drug-resistant-tb/en/>.
- A fact sheet "Scale up of FAST in Viet Nam" was published in May, 2015, available at <http://tbcare2.org/sites/default/files/FAST%20Vietnam%202015.pdf>

- With improved early TB and MDR TB case detection and treatment, the FAST strategy contributes to make both sites safer and healthier for patients and staff.
- Use of the simple patient information form at the OPD and ICU has helped standardize data recording and management, and improved ability of health care staff to quickly classify patients, request appropriate tests, and accurately diagnose patients with TB.
- Use of the unique patient code and patient searching tool on the hospital software provides an instant access to archives of complete patient histories and helps the doctor manage the patients more effectively.
- Use of the hospital software along with MS Access database and other reporting tools have contributed to improvement in overall TB patient tracking, management and reporting systems.

FAST in Malawi

1. Introduction

Significant improvements have been made in many high burden TB/HIV countries to increase the routine offer of HIV counselling and testing services for TB patients. The effective screening and identification of TB among HIV patients (the HIV “entry point”) continues to present challenges in many settings leading to delays in identifying TB cases, or favoring identification of patients with advanced disease. These challenges may be related to gaps in training for HIV staff, lack of adequate emphasis on identifying TB patients within HIV services, confusions or misunderstandings around TB screening protocols, or lack of knowledge about how and where to refer presumptive TB patients for diagnosis. The high load of patients at HIV care settings is another challenge in early screening and identification of TB among HIV positive clients, either in pre-ART or on ART. Providers, even if equipped with the knowledge and capacity to screen for TB, might not have enough time to conduct TB screening appropriately. There is also a lack in the integration of TB and HIV services. Timely identification of patients is critical for infection control.

Malawi is a country with high TB and HIV burden. Although 92% of TB patients know their HIV status, and CPT and ART uptake are at 88% and 81% respectively (WHO, 2012), there remain challenges in identifying and diagnosing TB among PLHIV: 74% of TB/HIV patients were on ART before starting their anti-TB treatment. Moreover, in the HIV care settings, 99% of ART clients are screened for TB, but only 1% (3,614) have been identified as presumptive TB: out of these 3,614 presumptive cases 1,678 had TB (almost 50%, while WHO recommends that if screening is done appropriately, the smear positivity rate among presumptive cases should be around 10%). Current data suggests that the quality of TB screening in HIV care settings is a challenge, as only very obvious TB cases are picked up, and other undiagnosed TB patients create an infection control risk for HIV patients and providers. The project proposes interventions and activities that will facilitate and increase the TB suspicion rate and improve the quality of TB screening in HIV care settings. These will be done through the reorganization of patient flow and duties of HIV care providers to increase testing for HIV patients along with implementation of the FAST core package of interventions. Lessons learnt and best practices

emanating from the interventions will be documented and shared widely, a necessity to undertake in Malawi specifically.

2. FAST project

This activity will introduce a new approach to improve infection control and rapidly identify TB patients at HIV service points by adapting the facility-level core package of the FAST strategy. FAST stands for Finding TB suspect cases Actively through cough surveillance, Separating them until diagnosis, and initiating effective Treatment early. The activity seeks to demonstrate the applicability of the FAST package of programmatic interventions at the HIV entry point by refocusing identification of TB cases as an urgent infection control priority for both patients and healthcare workers, linked with a heightened emphasis on active case finding and early treatment. The approach will benefit from existing interventions of TB CARE II.

Currently, implementation of TB screening at the HIV care sites is sub-optimal, and patients require several steps and multiple days to be tested for TB. Through implementation of the FAST strategy, TB CARE II will implement and test measures for streamlining immediate sputum collection and Xpert testing for HIV patients, and strengthening coordination between health care providers at the HIV setting and the TB Officer to initiate treatment.

2.1. Operational Objectives:

The main objective of this activity is to apply the FAST strategy to reduce TB transmission among both health care workers and patients in the healthcare facilities and in the community. FAST focuses on using rapid TB diagnostic methods for early detection and diagnosis of TB and MDR TB cases for early and effective treatment initiations.

2.2. Key activities:

- 1. Capacity building:** TB CARE II has trained 118 healthcare workers in Mangochi and 129 in Machinga.
- 2. Monitoring and Evaluation:**
 - a. The TB CARE II project encouraged interdepartmental review meetings to review data on weekly basis. An M&E task team was set up in the two districts to review data weekly. Members came from ART, TB and OPD departments. Weekly data reviews helped to improve the quality of the data reported and strengthen implementation.
 - b. In addition, the project imitated joint supervisory visits to the site along with the NTP: one visit was conducted in the reporting period by NTP Program Manager and TB CARE II CoP.
- 3. Site support:** The TB CARE II project supported the two districts by developing, printing, and distributing FAST M&E tools and consumables (X-Ray reagents).
- 4. Advocacy/dissemination:**
 - a. The program conducted one joint review meeting with the NTP in Machinga and Mangochi on 27 March, 2015.
 - b. Moreover, the Malawi team participated in FAST review meeting held in Bethesda, USA in May. Representatives from MoH from two FAST implementation districts shared their experience with the participants from Bangladesh, Vietnam, Mozambique, Nigeria, Russia, Swaziland, South Africa,

and Peru. They also participated in group discussions on FAST introduction, adaptation, data system, and scaling.

- c. During the reporting period, the TB CARE II team discussed the successes of FAST with partners from the MOH, as a result of which the FAST approach has been seriously considered in the GFATM TB/HIV joint submission for a possible scale up.
5. **Documentation of outcome.** As this activity will be run as a demonstration, emphasis has been put on working actively with the NTP, National HIV/AIDS Program and USG funded HIV program partners to review progress and document and describe the model in order to learn from experiences and identify opportunities for scale up.

3. Summary of Key Achievements

Approval for this activity was received in December 2014 after which FAST activities were scaled up successfully. Actual implementation began in March, and a review of the pilot study of FAST approach implementation in Machinga and Mangochi hospitals was conducted on March 27, 2015. TB CARE II staff have actively supported two hospitals within project target districts in Malawi: HIV care settings at Mangochi and Machinga district hospitals, which see approximately 6000 or more patients per day and both have GeneXpert platforms on site. The project has trained professionals on screening, referring, and diagnosing TB, and has supplied commodities such as recording/reporting forms and laboratory consumables. The project successfully presented its achievements during the FAST review meeting held in May 2015 in Bethesda, USA. TB CARE II staff actively participated and contributed to the group discussions on FAST introduction, adaptation, data system, and scaling. Additionally, the successes were discussed with the MOH partners, and the FAST approach was considered for the GFATMS TB/HIV joint submission.

Monitoring indicators for the period of April-June, 2015*

Table 1: Data from two FAST implementation districts, TB CARE II Core, Q3 PY5

Indicators	Mangochi	Machinga	Total
Number of people attending the facility		19722	19722
Total number of people screened for TB	658	1194	1852
Total number of presumptive TB cases identified	555	373	928
Total number of presumptive TB cases tested through smear microscopy	555	229	784
Total number of people with smear positive results	38	13	51
Total number of people tested through Gene-Xpert	337	174	511
Total number of MTB Positive cases	47	17	64
Total number of RIF resistant cases	6	1	7
Total number of Bacteriologically confirmed TB cases (smear positive and MTB positive)	85	30	115

*Since the project implementation started in March, the complete data were collected since April 2015. In March, there were 681 suspects identified and 19 had TB (11 smear positive and 8 MTB +, Gene Xpert)

Table 2: Proportions from two FAST implementation districts, TB CARE II Core, April-June, 2015

	Mangochi	Machinga	Total
Proportion of presumptive TB cases among total number of people screened	84%	31%	50%
Proportion of presumptive TB cases who were tested through microscopy	100%	61%	84%
Proportion of presumptive cases who had smear positive result	7%	3%	5%
Proportion of presumptive TB cases who had bacteriologically confirmed TB either with microscopy or with Gene Xpert	15%	8%	12%
Proportion of people tested through Gene Xpert who were MTB positive	14%	10%	13%
Proportion of people tested through Gene Xpert who were Rif Resistant	2%	1%	1%

4. Lessons Learnt

Expanding and sustaining the long term implementation of FAST will not happen automatically. There must be provisions to support the programs and facility managers in implementation of FAST activities. Apart from making policy and guidelines available, support will be needed for training of staff, and developing necessary support systems including recording and reporting, monitoring and supervision. Instead of a vertical strategy for scale up, FAST should be incorporated in the national strategic plan and dovetailed with the expansion plan for infection control, GeneXpert and CB DOTS.

TB In Mines

Background: An estimated one-third of TB infections in the Southern African region are linked to mining activities. Recent research has estimated that 3% to 7% of miners are becoming ill with the disease each year. The majority of those working in South Africa mines are migrant workers from neighboring countries (Lesotho, Mozambique, and Swaziland), resulting in a huge threat of cross-border spread. Each migrant worker who returns home with TB spreads the disease to an estimated 10 to 15 people in his community. Mine workers are exposed to a multitude of factors that compound their risk of TB infection. These risk factors include their working conditions including prolonged



exposure to silica dust, poor ventilation, exposure to occupational injuries; socio-economic factors, e.g., migrant status, cramped and unsanitary living conditions, lack of knowledge of the health system or their rights regarding access to care.

Objectives: The overall objective of the project is to improve detection and management of TB and other co-morbidities among the mine workers and their families, who are at increased risk of TB infection. The project will specifically focus on contributing to policy support and coordination to strengthen regional initiatives, incorporating a focus on small and medium sized mines, as well as intensive support to improve interventions with small and medium mines in the Southern African region including labor sending and receiving countries.

Implementation Progress

The project activities for TB in mines started in the first quarter of FY 2015. Key achievements are discussed below by the target countries:

South Africa

Rapid Assessment: A rapid assessment was conducted for appraisal of overall management of TB and HIV among small and medium sized mines so as to inform policy and programmatic support and better coordination. Findings reveal that health service delivery differs according to mines and can be categorized as either provided by the mines themselves or subcontracted to a provider outside the mine. Nurses were the main health work force in the mines. Training needs are highest for management of TB/HIV co-morbidities, infection control, TB screening and counseling topped the list.

TB screening is done in almost all the mines as part of annual checkups. X-ray was a common diagnostic means for annual checkups. The burden of TB was highest among the districts of Limpopo and North West compared to Northern Cape. TB cases for 2014 from 14 mines ranged from 1-328 cases with the highest numbers in Dr. Kenneth Kaunda and Bojanala district. Challenges related to TB management included; deprived other medication support for TB patients; poor HIV-TB integration; low HCT uptake; late TB treatment initiation; inadequate contact tracing; drug shortages in public health facilities; poor HIV reporting due to stigma and loss of jobs; insufficient infrastructure for infection control, insufficient IEC materials and poor data management.

Building Stakeholders Coalition for Management of TB and MDR-TB: In collaboration with the South African Business Coalition on HIV/AIDS (SABCOHA), the project convened PPP roadshows to bring together the business sector, including employers, workers and their representatives in all nine provinces, with a specific focus on provinces with a high number of mining activities. This contributed to the development of a conceptual framework on mainstreaming HIV, TB and wellness workplace programs towards a comprehensive and integrated mining sector response.

Key Achievements: The project supported a range of TB/HIV activities in selected mine health facilities and contributed to efforts to address TB in the mining sector. Using the TB/HIV toolkit,

the project collaborated in the training of health care workers and peer educators about TB in the workplace, including mines. The table below shows the training supported by the project during this reporting period.

Table 1: Training, supported by the project

Location		Activity	Participants
North West/Matlosana	West Vaal Mine Hospital	Basic TB-HIV management for nurses	20
Limpopo	De Beers (Musina	Basic TB Management for Peer Educators	80
Free State	Harmony Gold Mine - Welkom	Training of Nurses	7
Free State	Harmony Gold Mine - Welkom	Training of Health Educators in Mines	35
North West	West Vaal Mine Hospital	Infection Prevention and Control for Mine Peer Educators	20
North West	West Vaal Mine Hospital	Basic TB Management for Mine Peer Educators	20
Total			182

Intervention scale up: In South Africa, the project will implement TB screening activities in selected mining communities, and will support the implementation of a TB/HIV toolkit developed through SABCOHA.

Zimbabwe

Rapid Assessment: A rapid assessment of TB/HIV services offered to Miners in Zimbabwe was conducted. Key findings include shortage of staff, lack of equipment to measure dust levels and inadequate resources for visiting Mines hamper the Ministry to perform its responsibilities. Ensuring compliance with health and safety regulations is a major concern. The problem is specifically related to small scale miners who lack capital to comply with health and safety regulations. Most of the privately owned Mines provide TB/HIV services and get medicines mainly from the public sector. Compliance with national guidelines in these mines are better. The existing systems for data collection and management is not designed to report disease burden by mines. Training needs are identified for management of MDR TB and TB/HIV, occupational lung health and HIV testing and counselling.

Building Stakeholders Coalition for Management of TB and MDR-TB: The project supported the convening of three stakeholder consultative forum meetings to discuss and guide project activities, including a rapid assessment of TB in the mining sector in Zimbabwe and a review of the occupational lung diseases database held with the National Social Security Authority (NSSA), and to map the way towards addressing TB in the mining sector. The key partners included government ministries (Health, Mines and Mineral Resources, Labour and Social Welfare), the Zimbabwe Chamber of Mines, Zimbabwe Federation of Miners, non-governmental organizations, representatives of people Living with HIV, and the World Health Organization.

Key Achievements: The project facilitated consensus around plans to improve the management of TB in the mining sector, strengthening linkages between the mining sector and the government. The project supported mapping of TB/HIV activities in mine health facilities and public health facilities offering services to mining communities, trained 87 health care workers from five provinces on TB/HIV and silicosis, and initiated active TB/HIV case finding in mining communities especially among artisanal miners.

Table 2: Training, supported by the project

Type of Training	Type of Participants	No. of Participants
TB/HIV and MDR TB ToT	Doctors form MoH & Mines	16
TB/HIV and MDR TB care training	Health workers from Mines and MoH facilities serving mining communities	87

Intervention scale up: The project is scaling up active TB/HIV case finding in Mashonaland West Province and in Midlands Province. The populations in targeted districts is more than 50,000 people. The NTP has provided two mobile clinics equipped with a laboratory and X-ray machine.

Swaziland

Rapid Assessment

During the initial period of the project, an assessment was conducted to understand the disease burden of ex-miners. A standard medical examination form was used for data collection. Of the 565 examined ex-mineworkers, 3.9% had active recurrent TB. The results show that 78.40% of all the examined ex-mineworkers had silicosis. Most of the examined ex-mineworkers were working in the South African gold mines where they were exposed to silica dust. Almost all of the affected ex-mineworkers (silicosis cases) claimed that they were never compensated for the disease they acquired nor received any medical examinations and benefits as per labor laws. Almost 100% of the examined workers were found to be unaware of any post-employment benefits that they are entitled to. The assessment also found that 20% of the examined clients had or have both TB and HIV infection (co-infection). The rate of pneumoconiosis was 82% and HIV infection was 30% of the examined ex-mineworkers. About 18% of the ex-miners had massive lung fibrosis (MLF) either due to TB or silicosis or a combination of both. Noised induced hearing loss (NIHL) cases amounted to 43% of the respondents. Spirometry results showed that about 29% of the examined ex-mineworkers had abnormal spirograms or lung function tests.

Key Interventions

Interventions were done in strong collaboration with stakeholders, including Miner/ Ex-miners association (SWAMMIWA and SNEMA), the National TB control programme (NTCP), Ministry of Labour and Social Security (MOLSS), Maloma Colliery Mine, SafAIDS and local media houses. Interventions were:

1. Integration of occupational lung health clinic into TB Clinics, in the four regions of Swaziland, to improve early diagnosis of TB/HIV and other lung diseases.
2. Procurement of diagnostic and clinic equipment, as well as increasing access to diagnostics such as audiometry, spirometry, and x-rays essential and emergency medication for lung conditions
3. Advocacy and Social Mobilization with community leaders to strengthen referrals and linkages for early diagnosis of TB among Miners, Ex-miners and their families.
4. Advocacy meeting with Parliamentarians, for support in promoting a conducive policy and legislative environment for TB, HIV, Silicosis and other respiratory diseases in the Mining Sector.
5. Capacity building of health workers for screening, investigation and diagnosis of occupational lung health conditions such as silicosis.
6. Expanding TB workplace programs for local mines and assisting development of workplace policies in collaboration with the mining industries with a focus on TB services for miners.
7. Collaboration with other TB in the mines initiative under the Development Grant Fund



Swaziland Prime Minister Dr. Barnabas Dlamini at the Oshoek border sensitisation event for miners

Project Achievements

- Screening of about 911 ex miners in Swaziland for Silicosis, TB/HIV.
- Training of 84 Healthcare workers, from 12 healthcare facilities in the country, on the screening, early identification and management of Silicosis, TB and Silicosis/TB co-infection.

- Increasing awareness of signs and symptoms of Silicosis/TB co-infection through the mass media and community dialogues.
- 772 Miners and 448 ex-miners were reached with TB/HIV and silicosis information
- Development of a DR-TB treatment register to include miner's health, and distribution of 800 TB service directory.
- Garnering support for a legislation in favor of miners/ex-miners health, compensation and suitable working conditions through a sensitization meeting with the Swaziland Members of Parliament. An advocacy meeting with 37 Parliamentarians.

Botswana

Building Stakeholders Coalition for Management of TB and MDR-TB: A multi-stakeholder consultative forum was convened to discuss and guide project activities, including a rapid assessment of TB in the mining sector in Botswana, and to map the way towards addressing TB in the mining sector. The key partners included government ministries (Health, Mines, Energy and Water Resources, and Labour and Home Affairs), and the Botswana Chamber of Mines.

Policy system development support to host country: The project supported the revival of the National Committee on Prevention, and Management of Occupational Lung Diseases, from which a subcommittee called the Pneumoconiosis Panel was revived. A rapid assessment of the situation of TB in the mining sector was conducted to provide information to inform strategies and policies. The findings were presented to the national stakeholders' forum, and district TB and silicosis teams were formed to finalize and implement the action plan using recommendations from the rapid assessment.



Strengthening Capacity for Diagnosis and Management of TB and MDR-TB: The project developed a curriculum on TB/HIV and silicosis and adapted this to the local context, and trained a variety of health care workers from the public and private sectors, including district TB coordinators, pneumoconiosis focal persons, and safety, health and environmental officers.

Key Achievements: The project facilitated consensus around plans to improve the management of TB in the mining sector, strengthening linkages between the mining sector and the government by convening the first national consultative forum for TB in mines. The project

supported the revival of the National Committee on Prevention, Management of Occupational lung diseases.

The capacity for diagnosis and management of TB in the mining sector was strengthened by the training of 43 health care workers and by engaging all mining operations in Botswana (14 mine and 5 quarries and small works) through the rapid assessment.

Intervention scale up: The project raised TB awareness within mining sector. These initial activities established baselines, identified programmatic gaps and produced data to inform the development of strategies and policies to address TB in the mining sector across Botswana.

ADMINISTRATION OF CORE ACTIVITIES

Lessons and Administrative Best Practices

TB CARE II continued to develop materials, including technical briefs and reports, and publish them on the tbcare2.org website. The Program Management Support Group has also sought out other methods to disseminate information and materials produced by the project, such as monthly email updates to all TB CARE II partners, and by attending prominent conferences and meetings such as WHO STAG and the IUATLD World Conference held in Paris.

In this year TB CARE II was able to efficiently close out a couple of activities from prior years resulting in less overlap with new, Year 5 activities. In addition, there was considerable delay in starting-up of implemented of Year 5 activities.

Administrative Challenges

There was no Joint Strategic Meeting during Year 5, which made it more challenging than usual to develop core activities for next year. However, TB CARE II partners maintained contact with USAID and other technical partners via phone calls, email, and smaller in-person meetings to discuss progress of current activities and planning for new activities.

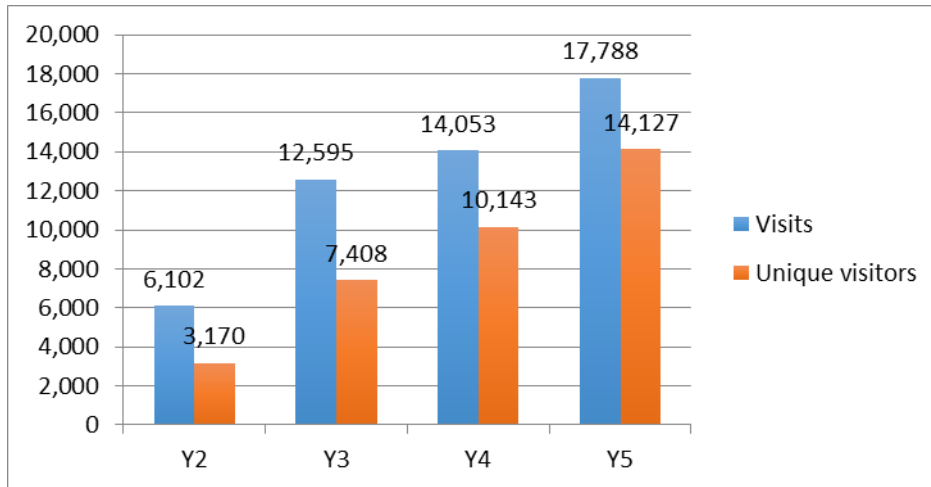
Environmental Monitoring and Mitigation Activities

TB CARE II conducted an initial environmental review alongside the development of the Year 5 core work plan, and continued to communicate with consortium members during the course of the year to provide information on the project's environmental monitoring process and to follow on all activities at the country and core levels. No activities in the core work plan were identified as carrying potential environmental threats, and as a result an Environmental Monitoring and Mitigation Plan was not developed for the core work plan.

APPENDIX - DR-TB Training Network

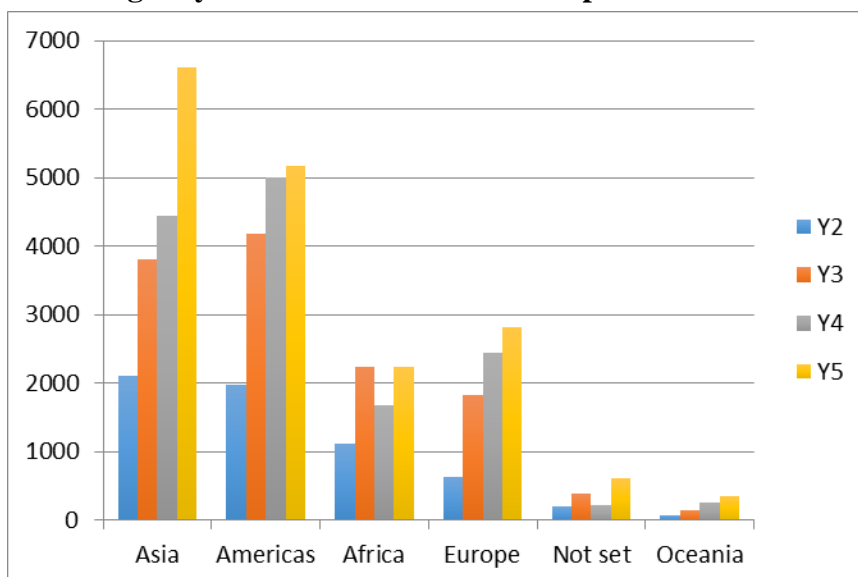
Visitor data is derived from the website's Google Analytics account. Webinar data is derived from Adobe Connect reports and Google Analytics for YouTube™ views. Geographical divisions are according to the United Nations.

Number of Visits and Unique Visitors – Y2 to Y5 Comparison



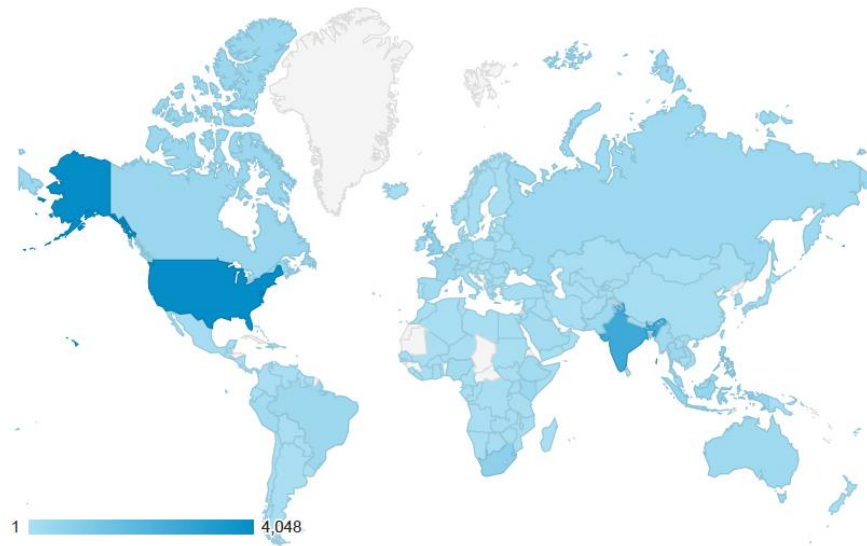
Sessions and number of unique visitors continued to increase in Y5. The number of unique visitors increased by 39% from Y4 to Y5 and increased 346% from Y2 to Y5. Page views decreased from a high of 42,283 in Y3, but were slightly higher in Y5 at 35,597 compared to 33,039 in Y4. As in Y4, this is likely due to a greater proportion of the site's content being static in Y5 as there were no PMDT Fellowships and fewer new clinical case discussions. The webinars were the main activity of the DR-TB Training Network in Y5 and this largely drives traffic away from the website to the Adobe Connect website.

Visit Origin by Continent – Y2 to Y5 Comparison



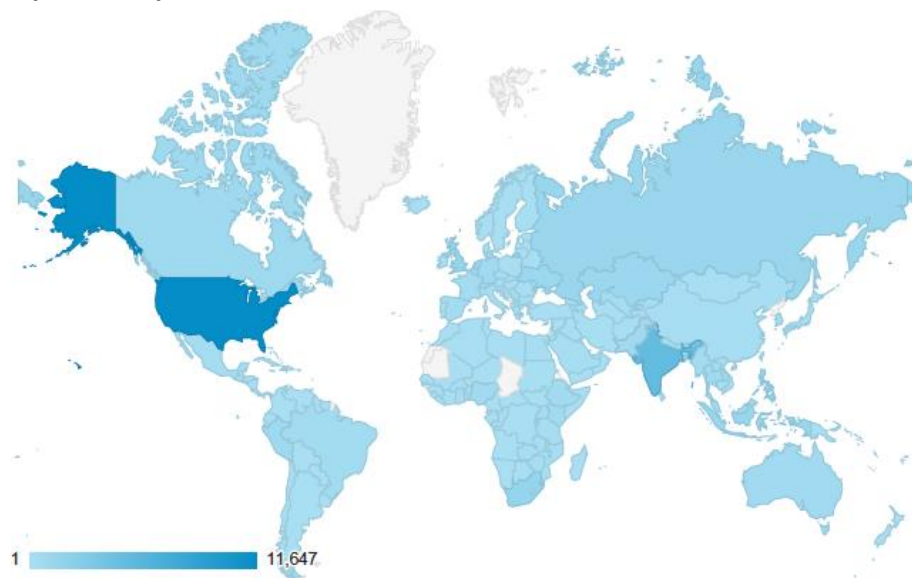
Visits in Y5 increased from Asia, the Americas, Europe, and Oceania. Visits from Africa increased in Y5 compared to Y4 but was slightly lower than the figure in Y3. For the Pediatric series, 54% of the participation events were from the Americas, primarily North America, followed by 21% from Asia, particularly Southern Asia. For the Hot Topics series, which focused primarily on bedaquiline, it was very similar: 50% of the participation events were from the Americas, again primarily North America, and 21% from Asia, mostly from Southern and South-Eastern Asia. Regular and affordable access to the Internet (especially high bandwidth connections for live participation in webinars) is a constraining factor in many resource-limited settings and is likely reflected in these figures.

Visit Origin by Country – Y5



Visits originated from 172 countries and territories in Y5 with the top 5 including: U.S.A., India, Philippines, South Africa, and the United Kingdom.

Visit Origin by Country – Y2-Y5



Over the course of four years, from October 1, 2012 through September 28, 2015, visits originated from 196 countries and territories with the top 5 the same as for Y5: U.S.A., India, Philippines, South Africa, and the United Kingdom.

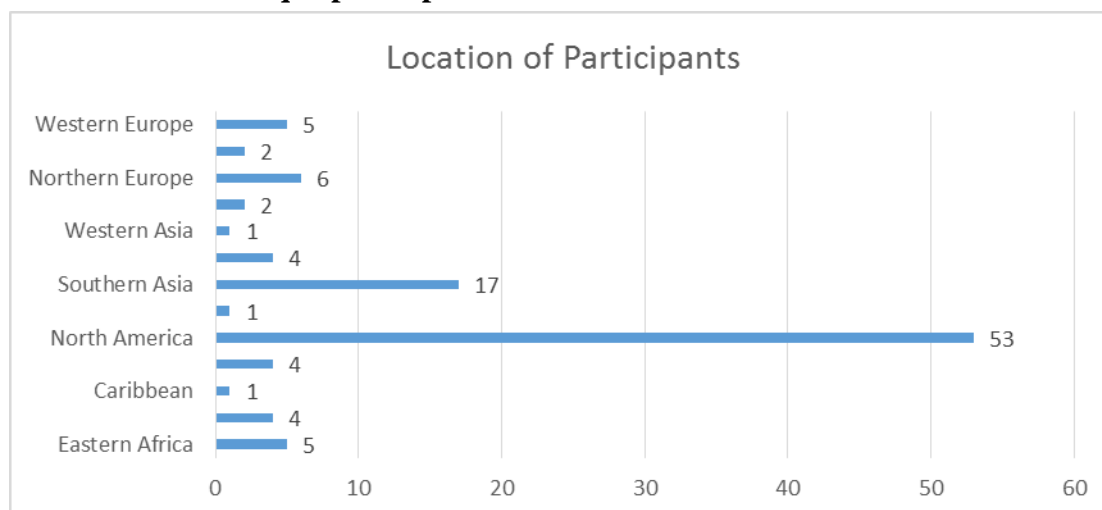
Characteristics of Y5 webinar participants

Participants completed a registration questionnaire via Adobe Connect.

Series 1: Pediatric DR-TB Series

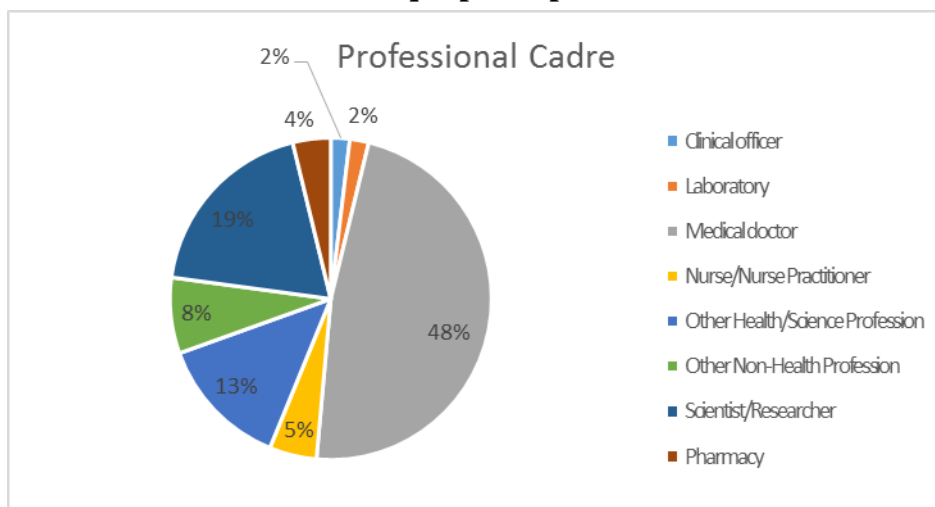
There were 4 webinars between October 9, 2014 and May 19, 2015 in English. The 204 participation events represented 105 unique individuals.

Location of 105 unique participants



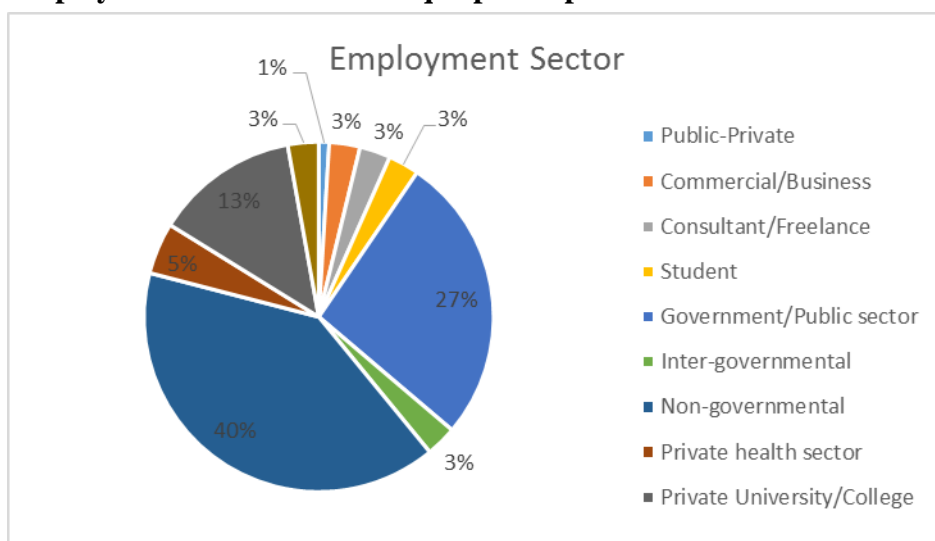
The Americas were well represented with 54% of the participants; Asia followed with 22%. In total, these individuals represented 31 countries.

Professional cadre of 105 unique participants



The majority of participants were medical doctors (48%) followed by scientists/researchers (19%).

Employment sector of 105 unique participants

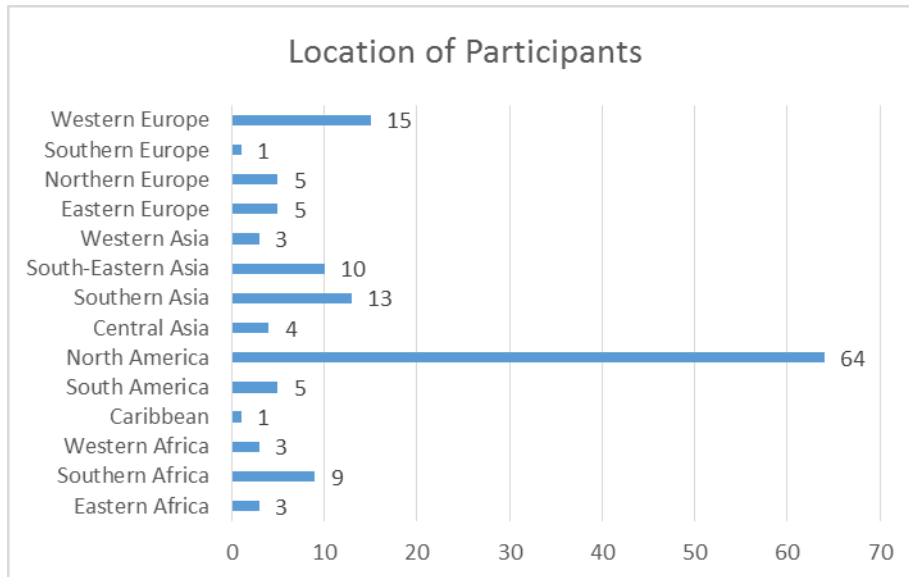


The two sectors most represented were those employed by non-governmental organizations (40%) and governments/public sector (27%).

Series 2: Hot Topics in DR-TB

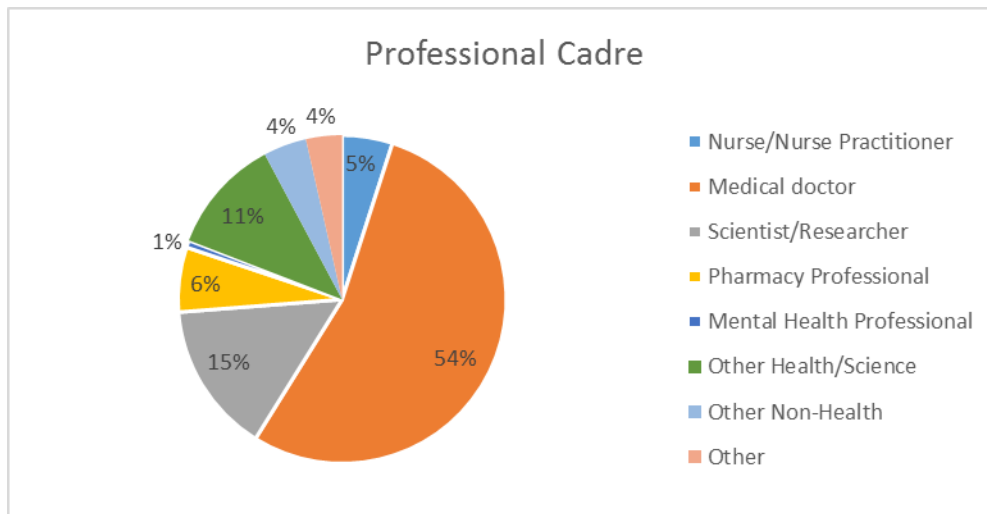
There were 5 webinars on hot topics, primarily related to the use of bedaquiline, between February 4 and May 1, 2014 in English. There were 252 participation events representing 141 individuals.

Location of 141 unique participants



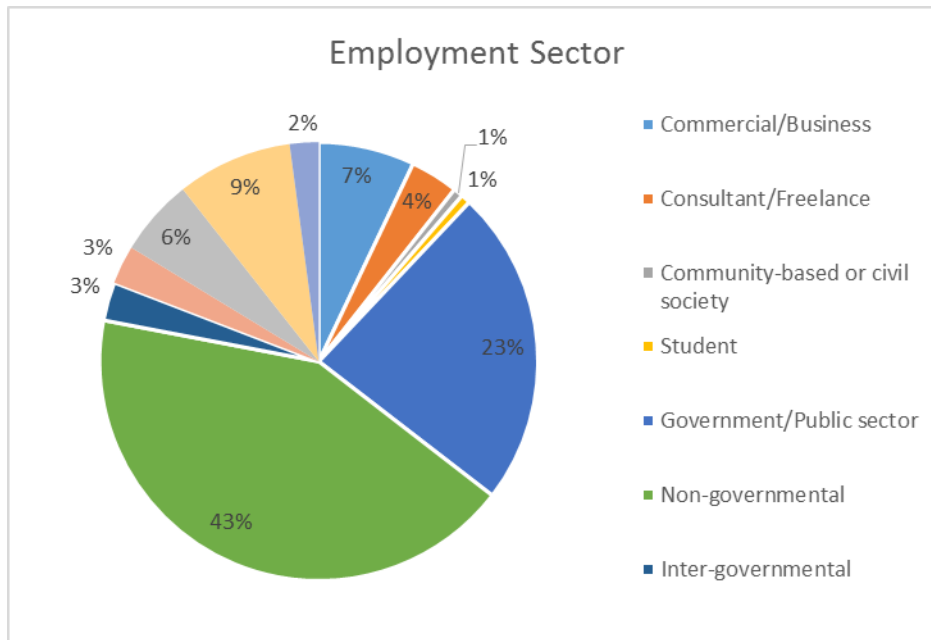
The Americas were well represented with 49% of the participants; Asia followed with 21%. In total, these individuals represented 35 countries (one Central Asian country was not specified).

Professional cadre of 141 unique participants



The majority of participants were medical doctors (54%), followed by scientists/researchers (15%).

Employment sector of 141 unique participants



The two sectors most represented were those employed by non-governmental organizations (43%) and governments/public sector (23%).

Webinars	Presentation downloads		Ever
	Y5	Ever	
2012 Drug-resistant tuberculosis: A historical overview	22	222	353
2012 Management of side-effects during MDR-TB treatment	31	285	677
2012 Second line medications for MDR-TB treatment; new drugs in the pipeline	15	186	274
2012 Basics of transmission control in an era of MDR-TB treatment	16	131	384
2012 Amplification and development of drug resistance: An overview	10	132	221
2012 Designing an MDR-TB treatment regimen	15	127	
2013 Course Introduction	18	139	44
2013 An overview of TB laboratory strengthening	8	109	288
2013 Treatment of MDR/XDR-TB: Patient selection and regimen design	13	128	302
2013 Reducing TB transmission in high-burden settings	0	83	71
2013 Drug management for program implementation: how to start and expand	10	52	156
2013 Community-based care for MDR-TB	12	70	69
2013 Quality of DR-TB care: activities that improve adherence and overall treatment outcomes	20	68	34
2013 An overview of TB laboratory strengthening - RUSSIAN	5	96	382
2013 Treatment of MDR/XDR-TB: Patient selection and regimen design - RUSSIAN	6	50	167
2013 Reducing TB transmission in high-burden settings - RUSSIAN	3	42	76
2013 Drug management for program implementation: how to start and expand - RUSSIAN	5	35	73
2013 Community-based care for MDR-TB - RUSSIAN	3	31	146
2013 Quality of DR-TB care: activities that improve adherence and overall treatment outcomes - RUSSIAN	1	29	25
2014 Demonstration of Gastric Aspiration Technique in Children	13	33	908
2014 Regimen Design and Dosing for Children with Drug-Resistant TB: A Case-Based Discussion	9	35	253
2014 Household Considerations in the Management of Children with DR-TB: Contact Tracing and Infection Control	10	25	59
2014 Adverse effects and adherence in children treated for MDR-TB	9	27	367
2014 Pediatric DR-TB Meningitis: A Case-Based Discussion	5	11	1417
2014 Raising Voices: Advocacy Issues in Pediatric DR-TB	9	10	81
2014 TB IC: administrative controls and the FAST strategy	30	50	78
2014 TB IC: building design, engineering, and respiratory protection	17	35	125
2014 TB IC: UVGI - planning, application, safety, and maintenance	11	19	286
2014 MDR/XDR-TB diagnostic approaches and considerations - FRENCH	6	10	55
2014 TB transmission in hospitals: theoretical and administrative control measures - RUSSIAN	7	20	171

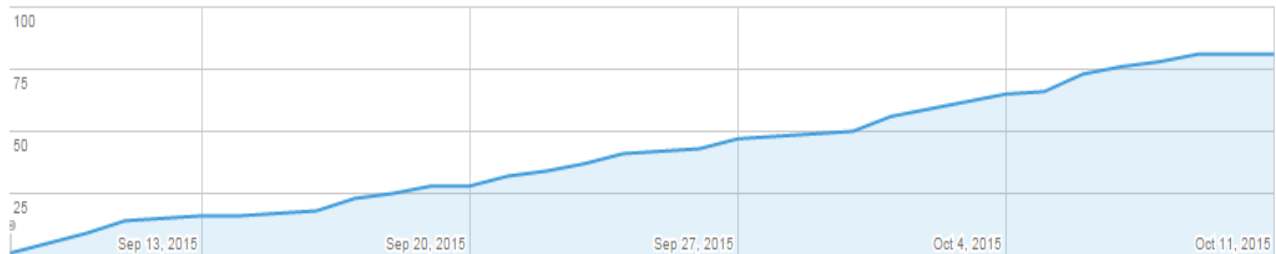
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Resources	Y5	Ever
2012 Community-Based Care for Drug-Resistant Tuberculosis: A Guide for Implementers	28	163
2012 Tracking Tool for TB Patients who meet the Criteria to be Screened for MDR-TB	11	56
2012 Training Course on the Clinical Management of Multidrug-Resistant TB - Participant Manual	25	142
2012 Training Course on the Clinical Management of Multidrug-Resistant TB - Facilitator Manual	40	175
2012 Training Course on the Clinical Management of Multidrug-Resistant TB - Pre-Test	20	111
2012 Training Course on the Clinical Management of Multidrug-Resistant TB - Post-Test	23	91
2012 Training Course Session 3 - Identifying Cases of MDR-TB	22	118
2012 Training Course Session 8 - MDR-TB in Children	20	94
2012 Management of Multidrug-Resistant Tuberculosis in Children: A Field Guide (1st & revised edition)	28	91
2013 FAST TB Infection Control Strategy Booklet	123	291
2013 FAST TB Infection Control Strategy Job Aids (2)	47	161
2013 FAST TB Infection Control Strategy Posters (7)	131	434
2013 The PIH Guide to the Medical Management of Multidrug-Resistant Tuberculosis (manual only)	251	551
2013 The PIH Guide to the Medical Management of Multidrug-Resistant Tuberculosis (forms only)	3	26
2014 The PIH Guide to the Medical Management of Multidrug-Resistant Tuberculosis (RUSSIAN TRANSLATION)	9	9
2014 Lessons Learned from Best Practices in Psycho-Socio-Economic Support for Tuberculosis Patients	14	14
2015 Management of Multidrug-Resistant Tuberculosis in Children: A Field Guide (RUSSIAN TRANSLATION)	0	0
2015 Medical Management of MDR-TB App (Android version)	81*	81*
2015 FAST TB Infection Control Strategy Booklet (SPANISH TRANSLATION)	1	1
2015 FAST TB Infection Control Strategy Job Aids (SPANISH TRANSLATION)	1	1
2015 FAST TB Infection Control Posters (SPANISH TRANSLATION)	2	2
PDF Case Studies - English	154	283
PDF Case Studies - French	4	10
PDF Case Studies - Spanish	1	31
PDF Case Studies - Russian	19	72
TOTAL	1013	2907

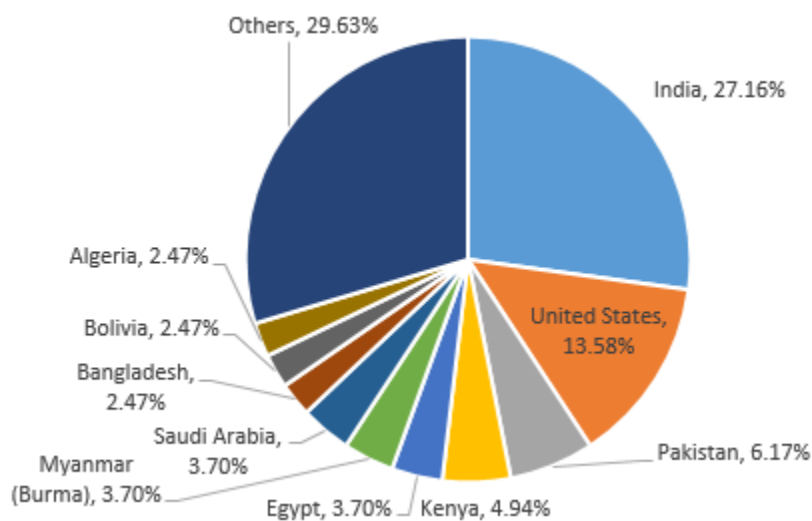
*Some of the 2015 resources were completed close to the end of the project. For example, the Medical Management of MDR-TB App (Android version) was made available on the Google

Play store on September 8, 2015. By October 11, 2015, it had been downloaded 81 times representing people in various countries. Please see the charts below regarding the download activity of this mobile application.

Downloads by date



Downloads by country



One final DR-TB Training Network newsletter was sent out to inform users of the site of all the materials available. The website will remain online, but static in terms of content, until April 2016, ensuring that these resources will continue to be available beyond the end of the project for a number of months.